Antiquity

A Quarterly Review of Archaeology

VOL. V NO. 18 JUNE 1931

Editorial Notes

ENGLAND is the home of paradox; and it is not therefore surprising that a country which has produced some of the greatest pioneers of scientific archaeology should be open to the charge of neglecting its own origins. We are not for the moment thinking of the prehistoric period, though much that we shall say applies with equal force to that period; nor, on the other hand, are we criticizing the activities of the State or the leading societies and museums. These all have played their part in maintaining, by endowment and organization, the study of British archaeology and the conservation of British antiquities and records. What we have in mind is the astonishing fact that, so far as we are aware, there exists no University Chair of what may be called Old English Archaeology.

We use the expression 'Old English Archaeology' to cover the antiquities of the Saxon, Danish and Norman periods. Of pagan Saxon antiquities (falling between, say, A.D. 450 and 650) such knowledge as we have is concentrated in a very few individuals whose numbers are barely maintained, much less increased, as the years go by. It is to be feared that, unless the situation is retrieved by the endowment of a chair, this knowledge may lapse altogether. Nor is it altogether to our credit that some of the most recent monographs on Anglo–Saxon antiquities should have been written by distinguished continental

scholars like Aberg and Roeder. That we sincerely welcome such contributions to knowledge goes without saying ; but we do so with a slight feeling of shame that our own garden should have to be tended by our neighbours.

The number of specialists in Anglo-Saxon archaeology is indeed extremely small. We doubt whether there are more than half a dozen people in the whole country who know the difference between a Saxon and a Jutish brooch, assuming for the moment that any such difference exists. Such a state of affairs is a definite obstacle to progress, for without a lively atmosphere of informed criticism, without constant discussion and the occasional re-examination of first principles, opinion is bound to crystallize into dogma. Probably no one knows and regrets this so much as the expert himself ; for what is more profitable or more pleasant than to talk about the problems of one's own period with someone else who is trying to solve them ? Moreover there is the risk that, as time goes on, some critic may discover that the foundations are built on sand. We have often wondered whether the foundations of Anglo-Saxon archaeology are well and truly laid. We know of no modern attempt to lay bare and examine the first principles upon which it is based.

Contrast this state of things with that obtaining in Romano-British archaeology. Here the number of students is large and the foundations secure. What is the reason ? By general agreement it can be attributed to the influence of one man—the late Professor Haverfield of Oxford—whose former pupils are still working under his inspiration. Professor Haverfield was able to accomplish his great work because he had the leisure and opportunities of personal contact afforded by a University Chair. It is to the Universities that we look for a lead, and particularly to those most concerned with historical teaching. For historians are agreed that in archaeology (together of course with the study of place-names) lies the chief hope of light in their dark places ; and we feel confident that the policy we advocate will have their warm support.

Few people, again, realize the extent of our ignorance about the archaeology of Britain during the centuries before and after the

Norman Conquest. Take the two most important classes of remains—pottery and earthworks. Is there a single pot that can be *proved* to belong to the period A.D. 700–1000? Such may exist, but even so there is certainly no general knowledge of the wares of the period. There cannot be until a habitation-site, deserted about 1000 and not re-occupied, has been scientifically excavated; or until a 'sealed' find of such pottery comes to light in some other way. Of Saxon and Danish earthworks we know, from archaeology, nothing. There are certain towns, such as Wallingford, Cricklade and Wareham, enclosed within rectangular ramparts that are generally, and probably rightly, regarded as of late Saxon construction; but this has never been proved, or even tested, by excavation. There are many places where the Danes are known, from statements in the Chronicle, to have 'wrought a work'; but not one of them has been excavated. Of relics of the Danes themselves we possess a few battle-axes, but no pottery whatever that can in any way be associated with them. Being but temporary raiders they may not have made pottery, which under primitive conditions is nearly always the work of women; but they can hardly have lived a whole winter at places like Thanet, Sheppey, Nottingham and York without at any rate using the pots of their unwilling hosts; and even a few fragments of these would be welcome.

Of Anglo-Saxon earthworks we know hardly anything. Of the period 700–1000 the only remains which are known to survive are Offa's Dyke and the before-mentioned town-ramparts.

This state of affairs can only be remedied by the appointment of a Professor of Old English Archaeology at one of our leading Universities. It would be essential to appoint a trained archaeologist, not merely a historian who is interested in archaeology. Such a man could create a School and do the work, of guidance and inspiration, that has at present to be done by overworked college tutors and museum curators. The necessary funds might be found by abolishing a few of the many useless professorships that abound. However, this is perhaps an idle dream. New endowments are usually reserved for those who tread the well-worn tracks of history, art and literature, or for subjects which might well be left to look after themselves. Was there, for instance,

any urgent demand for a Chair of Belgian Studies (whatever they may be) at London University? Would not a Chair of Old English Studies have been more appropriate ?

We have very gladly assented to the wish of the Director of the British Museum that we would insert in the present number the memorandum on Treasure Trove prepared by him. We may also mention that his paper on ' The Law and Practice of Treasure Trove ', printed in *The Antiquaries' Journal*, July 1930, is full of interest for those who wish to know more on this subject, about which very hazy ideas are held.

We feel we owe an explanation to our readers and also to authors and publishers for the delay in printing reviews of some of the many books we receive. We very much regret it, but it is inevitable. The number of books, many of them very good books, appearing nowadays is so great that it is difficult to deal with them adequately. We intend in our next number to print a list of Books Received which we cannot, for the reason mentioned, review at length. Meanwhile we cannot forbear mentioning three outstanding books that still have to be reviewed—Sir Arthur Evans' *Palace of Minos*, vol. 3 (Macmillan) ; Professor Oswald Menghin's *Weltgeschichte der Steinzeit* (Anton Schroll, Vienna) ; and Mr R. G. Collingwood's *Archaeology of Roman Britain* (Methuen). Though differing entirely in character, each is a landmark in its way, whether of synthesis, of succinct statement, or of the progress of knowledge.

We regret that the plan of Cissbury Camp facing page 67 of our March number was incorrectly described. With the present issue is enclosed a revised print which should be inserted in its place.

The Ordnance Survey

by Sir CHARLES CLOSE
Formerly Director-General, Ordnance Survey

THE connexion between Maps and Archaeology is of a very obvious and straightforward nature. All distributional problems must, for instance, be studied on maps. If we want to find out about the distribution of the beaker folk, we must plot on a map the finds of the beakers ; or if we desire to learn the area covered by examples of the ' lanternes des morts ', a map of France is essential ; the same applies to the study of long barrows and to a very great variety of archaeological studies. Moreover, in a more restricted sense, maps of sites are of the essence of the study of antiquity ; we cannot understand the strength of the defences of the ancient Jebusite city unless we pore over the map of the excavations on the spur of Ophel. The excavations of every site are unintelligible without an accompanying map. In a still more restricted sense, each ' find ' requires to have its position stated by the three co-ordinates of map-making: namely, its distance north or south, east or west, from—and above or below—some datum point in the excavations. Further, the maps themselves may furnish the only record left of some relic of antiquity. And, lastly, ancient maps—and our present-day maps will one day be ancient—are valuable records of the past, of the culture of the age they represent, of population, human distribution and settlement, and, to some extent, of the science and art of the times. It is much to be regretted that so little map-making was done in ancient days. We should give a good deal for accurate contemporary plans of Rome of the time of Nero or of the battle of Hastings. And how much more for a contemporary map of Jerusalem and its surrounding country, before the destruction of the Holy City by Titus !

So much by way of apology for the appearance of an article on the British National Survey in a journal devoted to Archaeology. But perhaps one thing more remains to be said. Modern maps of the best class are able to show, with great clearness and accuracy, the features, both natural and artificial, of the country that they portray. It is,

therefore, a duty that we own to posterity to leave behind us a reliable, graphic, description of the world as we find it, during our brief occupation of our temporary inheritance. The information will be of value and interest to our successors in that inheritance.

Space does not admit of an account of the general development of the cartography of the British Isles, and we may not describe the maps of Ptolemy, or of Matthew Paris, or the truly remarkable fourteenth century map of Great Britain which is in the Bodleian Library at Oxford. Nor can we discuss the appearance of these islands in the Portolan Charts, or in the little known map of 1534, or in Lily's of 1546, or in Mercator's of 1564. But, perhaps, a word should be said about Christopher Saxton's Atlas of England and Wales, for Saxton is an honoured predecessor of the Ordnance Survey. He was the first of the moderns to make a new and personally executed survey to form the basis of his maps. He worked under official permission and encouragement, being provided with an ' open letter ' to Justices of the Peace, Mayors and others, who were directed to assist him in the accomplishment of the service upon which he was engaged. He published in 1583 a large scale map of England and Wales, about 8 miles to the inch, engraved on twenty sheets, of which no copy was known until quite recently. The late Sir George Fordham, in his account[1] of Saxton, said that ' no original impression is now known ' but it is worth while to record that in October 1930 a copy was in the possession of Mr Francis Edwards (catalogue 530, no. 105).[2] Saxton's county maps, on a large scale for those days, remained for two hundred years the original source of other published maps of the counties. He completed his great work of surveying England and Wales between the years 1570 and 1579. If we take his map of ' Southamtonia ' as an example, we shall find this engraved and printed on one sheet ; the scale being about 3 miles to the inch, and the mile about 2000 yards long. But this matter of the varying length of the Old English Mile is another story, and so we take leave of Christopher Saxton, the semi-official forerunner of the Ordnance Survey.

A more directly official predecessor is Sir William Petty, who originated and carried out the ' Down Survey ' of Ireland, between the

---

[1] *Christopher Saxton of Dunningley*. Reprinted from the Thoresby Society's *Miscellanea*, vol. XXVIII. Leeds : John Whitehead and Sons, 1928.

[2] Formerly at Docking Hall, Norfolk, and now in the British Museum. See *British Museum Quarterly*, March 1931, pp. 118–19.—EDITOR.

years 1655 and 1659—they certainly worked well in those days. This celebrated survey was undertaken to facilitate the ' settlement ' by the Cromwellian Government of the English soldiers and ' adventurers ' who were to take the place of the dispossessed Irish. It is curious to note that the first systematic plantation was carried out by Queen Mary, in Leix and Offaly ; so that we must not place the blame of, what is to us nowadays, an inhuman operation, upon religious fervour alone. The ' Down Survey ', which was to enable the distribution of lands to be carried out, was a consequence of an Act of 1653, passed under the Commonwealth, and entitled ' An Act for the Satisfaction of the Adventurers for Lands in Ireland, and of the Arrears due to the Soldiery there, and of other publique Debts '. Mr Worsley and Doctor William Petty were put jointly in charge of the work, and were directed to take all necessary steps for the ' exact and perfect survey and admeasurement of all and every the honors, baronies, castles, manors, lands, tenements, and hereditaments forfeited '. Doctor Petty soon got rid of Worsley, whose methods were certainly not as sound as his own. He was then given a contract for the whole work and made a fine fortune out of it, as he deserved. The parish maps were on scales of 6.4, or 3.2, inches to the mile ; and the barony maps on the scale, for the most part, of 1.6 inches to the mile. By the close of 1659 Petty had surveyed some five million acres in twenty-nine counties, a wonderful feat. Those who desire to study in detail the circumstances of this remarkable operation, may be well advised to read the interesting and elaborate study of Mr Y. M. Goblet,[3] a book which is the last word on the subject.

From Saxton in the sixteenth century, and Petty in the seventeenth, there is nothing of importance to describe in the way of the official mapping of the British Isles, until we come to the middle of the eighteenth century—and the work of General William Roy.

After the battle of Culloden, which was fought on a misty day in April 1746, the Quarter-Master-General, Lieut.-General Watson, who had evidently experienced the need of reliable maps during the operations —a need which could not then be satisfied—determined to make a map of the Highlands. This map was begun in 1747, and it is from this date that the Ordnance Survey is sometimes supposed to have come into existence, although, as a fact, the official foundation of the

[3] *La Transformation de la gèographie politique de l'Irlande au* XVIIe *siècle.* Paris : Berger-Levrault, 2 vols. 1930.

department did not take place until forty-four years later. But the map ordered by General Watson is in the strict historical succession of official maps, and did lead, indirectly, to the creation of the National Survey.

General Roy,[4] writing in 1785, says, with reference to General Watson, ' This officer, being himself an Engineer, active and indefatigable, a zealous promoter of every useful undertaking, and the warm and steady friend of the industrious, first conceived the idea of making a map of the Highlands. As Assistant-Quarter-Master, it fell to my lot to begin, and afterwards to have a considerable share in, the execution of that map ; which being undertaken under the auspices of the Duke of Cumberland, and meant at first to be confined to the Highlands only, was nevertheless at last extended to the Lowlands ; and thus made general in what related to the mainland of Scotland. Although this work, which is still in manuscript, and in an unfinished state, possessed considerable merit, and perfectly answered the purpose for which it was originally intended ; yet having been carried out with instruments of the common, or even inferior kind, and the sum allowed for it being inadequate to the execution of so great a design in the best manner, it is rather to be considered as a magnificent military sketch, than a very accurate map of a country'. He goes on to say that the breaking out of the Seven Years' War in 1755 put a stop to the final completion and improvement of the map.

The original field sheets of Watson's map are in the British Museum so far as concerns that part of Scotland which is north of the Forth and the Clyde. It is a compass sketch, uncontrolled by any more rigid framework, and is, in its method of execution, inferior to the work of William Petty of a century earlier. The ' fair protraction ' of the map is also in the British Museum, and this covers the whole of Scotland except the islands. The scale is one thousand yards to one inch. It constitutes a valuable record of the surface utilization of Scotland as it was nearly two hundred years ago.

Now a word about William Roy himself. He was born in Carluke parish, Lanarkshire, in 1726, and was educated at Carluke and at Lanark. In 1747 he seems to have held a minor position in the Post Office at Edinburgh. In that year he was first employed by Watson on the map of the Highlands. Sir George Macdonald thinks that he

[4] General Roy, ' Account of the Measurement of a Base on Hounslow Heath '. *Philosophical Transactions of the Royal Society*, 1785.

was not in the army at all whilst he was on this work. He became a Practitioner Engineer in the army in 1755, and received a commission in the 53rd Foot in 1756. This regiment was re-numbered the 51st in 1757.[5] We need not pursue his various ranks in the service, beyond remarking that he was made a Major-General in 1781. He fought at Minden in 1759 and made a plan of the battlefield showing the positions of the troops. The plan is preserved in the British Museum. In 1765 he was appointed, by Royal Warrant, Surveyor-General of Coasts and Engineer for making Military Surveys in Great Britain, in addition to his appointment as D.Q.M.G. But Roy is not only known as a soldier and military surveyor. He has a special niche of his own as an antiquary. Even as early as the days of the making of the Highland map, he appears to have been interested in the study of the past ; for, towards the end of his life, he writes that ' though at that early period, the study of Antiquity was but little the object of the young people employed in that service, yet it was not wholly neglected '. And we may say that throughout his life this study was only second in his affections to his immediate military duties. His great work, *The Military Antiquities of the Romans in North Britain*, was left in manuscript at the time of his death, and was published in a splendid folio, in 1793, by the Society of Antiquaries. An admirable study of Roy and his *Military Antiquities* was also written by Sir George Macdonald, and printed by the Society.[6]

From the time of the breaking out of the war in 1755, and the consequent cessation of work upon the map of Scotland, Roy never forgot his intention of pressing for the execution of a reliable map of the whole of Great Britain, and his appointment as Engineer for making Military Surveys gave him the opportunity of putting forward his views in high quarters. He says that ' on the conclusion of the peace of 1763 it came for the first time under the consideration of Government to make a general survey of the whole island at public cost '. But the outbreak of war with the American Colonies again made it necessary to put aside, for the time, the consideration of this scheme, and it was not until after the peace of 1783 that the matter could be dealt with. Meanwhile, immediately after the peace, Roy, for his ' own private amusement ' measured a base across the

---

[5] Col. H. C. Wylly, *History of the King's Own Yorkshire Light Infantry*, I, 10.

[6] ' General William Roy and his Military Antiquities of the Romans in North Britain '. *Archaeologia*, 1917, LXVIII, 161-228.

fields between ' the Jew's Harp near Marybone and Black Lane near Pancras, as a foundation for a series of triangles—for determining the most remarkable steeples and other places in and about the Capital '.

It was in 1783 that the first step was taken towards the accurate mapping of this country, but the step was not a very direct one, and on the face of it, was a step more in the direction of pure scientific investigation than such a practical thing as a survey. But the two things are much intermixed, and one helps the other. The matter arose in this way. The third Cassini, Director of the Royal Observatory at Paris, wrote a ' mémoire ', which was transmitted by the French to the British Government, and referred by the latter to the Royal Society. The mémoire was not very tactfully worded, but the gist of it was that the French desired the execution of a trigonometrical connexion between Greenwich Observatory and that at Paris. The time was opportune ; the war was over ; we were on reasonably good terms with the French ; and the object proposed had the goodwill of scientific men on both sides of the Channel. And there was a man ready at hand to do the work. George III himself took an interest in the operation, of which the execution was, of course, confided to Roy, then a man of fifty-seven. The King seems to have paid for the instruments. After discussion between Banks the President of the Royal Society, Ramsden the instrument maker, Roy, and Maskelyne the Astronomer Royal, a great three-foot theodolite, the Father of all accurate theodolites, was ordered from Ramsden—and in his usual dilatory way, he took three years to make it. It was finished in 1787 and remained in use until 1853.

The measurement of the Base on Hounslow Heath, in 1784, has been often described. It was 27,404.0 feet long, and, when re-measured in 1791, the new value agreed within four inches. The terminal points of this base still exist, and are marked by guns buried vertically, muzzle upward. These terminals were specially fenced in and inscriptions affixed, a few years ago, to celebrate the two-hundredth anniversary of Roy's birth. At the original measurement George III honoured the operation by his presence ' for the space of two hours, entering very minutely into the work of conducting it, which met with his gracious approbation '. And the respectable and very worthy President of the Royal Society, Sir Joseph Banks, during the final stages, ordered his tents to be pitched near at hand, where his guests and other visitors 'met with the most hospitable supply of every necessary, and even elegant refreshment '.

During the next few years Roy and his assistants, much delayed by Ramsden, went on with the triangulation which was to connect England and France, and finished it in 1788. The English and French values agreed as regards lengths within about one part in twenty-thousand—a good result for those days. Throughout it all Roy always bore in mind his ultimate object of making a reliable map of Great Britain, and in his last paper, which he wrote just before his death, he recommends that the operation should be extended over the whole island—'The honour of the nation is concerned in having at least as good a map of this as there is of any other country'. Roy died in Argyll street, London, in July 1790. He has always been looked upon as the true founder of the Ordnance Survey. The official establishment of the department was the next step to be taken. This step we owe entirely to the third Duke of Richmond, Master General of the Ordnance. He was well acquainted with Roy and his work and had helped the early operation by lending men and stores from the Board of Ordnance. The course of events was something like this: the Duke had every wish to continue the Survey and probably had in mind the military value of a reliable map of the southern counties, for we were on the verge of war with France; the Royal Society, having seen the completion of the junction of the two observatories, were not unwilling to be relieved of further responsibility. On 12 July 1791 the Ordnance Survey was founded by order of the Master General and Board of Ordnance. But it was not as yet known by that title.

An unhappy selection was made for the first Director. One who served under him said that he never made an observation, nor did a calculation, nor wrote a line of any of the printed accounts; he frequently retarded the progress of the work; 'and the only time he benefited the service was when he took his departure to the next world'. But, most fortunately, he had an admirable assistant, Lieut. William Mudge, of the Royal Artillery. Mudge was appointed on the formation of the Survey, became Director in 1798, and remained in that post until his death in 1820. In view of the first Director's incapacity, we may reasonably suppose that Mudge had effective control of the work from the time of his first appointment, that is, for a period of twenty-nine years. The Survey owes much to him. He had many difficulties to contend with: shortness of funds; sometimes an unsympathetic Board of Ordnance after the departure of the Duke of Richmond; and a military enquiry which he much resented. But he weathered all the storms.

The main work was the construction of a map of Great Britain on the scale of one inch to one mile. This was based on the triangulation; and the detail, in those early days, was carried out in the field by compass and pacing, or cyclometer, on the field scale of two inches to a mile. The first Ordnance Map, that is the first map issued by the Ordnance Survey for the use of the public, was the map of Kent published on 1 January 1801—appropriately on the first day of the nineteenth century. These are by far the finest maps of this country that had hitherto appeared; well engraved, clear and accurate. At that date they were, one may say, the finest maps in the world, although the hachures look to us, now, a little primitive. The two-inch sheets from which the one-inch were engraved, are valuable sources of information as to the appearance of the country at the date of their execution; they sometimes give archaeological information which would otherwise be lost. The published one-inch sheets were of course, printed in black from the copper plate, and there are those who regret the discontinuance by the Ordnance Survey of this, the oldest method of printing maps. These maps were artistic in their way, easy to read where there is not much detail, and printed on good paper that is likely to last. The use of colour killed the old black engraved map; the use of colour, that is, combined with the printing from stone or zinc. There was an intermediate stage during which the detail was 'transferred' from the copper to stone or zinc, but this has now been rightly given up, and the one-inch maps are no longer engraved on copper, but are drawn for reproduction in colour, from zinc plates. The change took many years to accomplish, but was clearly inevitable. The coloured maps are much easier to read, especially when they represent complicated country with much detail; the public showed that it did not want the old type of map, by simply not buying it; the Army had long shown a preference for coloured maps; and the increasing use of maps, both by the public, and by officials, necessitated the issue of large editions which the slow-printing copper-plate press could not cope with.

We need not enter further into the history of the one-inch maps of these islands. Modern maps will not last as well as the old maps; the paper is not so durable, and the colours will fade. Our antiquarian successors may bewail the change to colour; but, after all, maps are made chiefly for the use of this generation. It would however be reasonable to print, on specially durable paper, and to take special precautions for the custody in air-tight and light-tight cases, of

record copies, to be stored in the British Museum and at the Ordnance Survey.

The next notable stage in the history of the Survey was due to the action of the House of Commons, which, in 1824, resolved, 'that it is expedient, for the purpose of apportioning more equally the local burthens of Ireland, to provide for a general Survey and Valuation of that part of the United Kingdom'. A Select Committee was appointed which expressed the opinion that the ' execution of the Survey cannot be placed in better hands than in those of the Ordnance Officers ', and went on to say that the work should be carried out much more rapidly than the Trigonometrical Survey of England. The scale decided upon by the Committee was six inches to the English mile. And so the six-inch scale came into existence. Major Thomas Colby was then Director of the Survey. He had succeeded Mudge in 1820, and he remained in that position until 1847, when he retired, being then a Major-General. He writes, ' When the House of Commons ordered a Survey of Ireland on a scale of six inches to one mile, His Grace [the Duke of Wellington] confided to me the direction of that Survey. The entire Survey of a large country, with the minutiae of detail and accuracy required for a valuation of land, had no precedent of any similar work to guide its arrangements. I, therefore, devised new methods which I proposed for His Grace's sanction '.

The work began in 1825, with the commencement of the great triangulation of Ireland. Rays were observed with a three-foot theodolite from the tops of the mountains ; the longest ray in Ireland being that from Cuilcagh to Keeper, 102 miles long. Three rays cover the length of the country from north to south. Two rays are sufficient to cross Ireland from the Irish Sea to the Atlantic. The observations of such long rays was rendered possible by Lieut. Drummond's invention of the limelight. This officer became better known ten years later, when he was appointed Under-Secretary for Ireland and virtual ruler of the country.

This is not the place to describe the technical methods employed ; or how that experienced soldier and geologist, Portlock, executed, almost unaided, the great triangulation ; or how Colby and his assistants measured the celebrated base on the shores of Lough Foyle ; or how anxiously they waited through the mist for a sight on distant hills of Drummond's light; or how a committee of enquiry was appointed—for Colby had very similar troubles to those of Mudge. Colby overcame all his difficulties ; his name ranks with that of Roy as a founder of

the Survey, and before he retired he had the satisfaction of seeing the completion of the original six-inch survey of the whole of Ireland, an undertaking quite unprecedented in those days. These six-inch sheets were admirably engraved, and modern six-inch sheets look a little less finely executed in comparison, for the modern sheets are drawn and printed from zinc ; the expense and slowness of the engraving made the change absolutely imperative.

It was now the turn of Scotland, for which nothing official had been done since the making of the sketch map of 1747–55. Various bodies in Scotland petitioned the Government, and the upshot was that a six-inch survey of Scotland—and of the six northern counties of England—was approved and work was begun on it in 1838. But we need not spend any time in discussing this, for the methods were, in all important particulars, the same as those used in Ireland.

For the next quarter of a century there was much discussion, both in and out of Parliament as to the best scales for the national large-scale maps, and it was not until 1863 that, following on a recommendation of a Select Committee, a Government decision was come to, by which the scale of six inches to one mile, and also the scale of 1 : 2500, or about twentyfive inches to one mile, were adopted. There were also some larger town scales which need not detain us ; they have no present-day importance. The experience of two generations has proved the soundness of the decision made in 1863. For land and estate work the twentyfive-inch plans are very convenient—it should perhaps be said that, for simplicity, the maps on the scale of 1 : 2500, which may be expressed as 25.344 inches to a mile, are usually referred to as the twentyfive-inch maps. Sheets on this scale cover the whole of Great Britain, except waste and mountainous regions. There are more than fifty thousand of them. No country in the world is so well provided with large scale maps. As to the six-inch, they are contoured and are indispensable for all engineering and a host of other purposes. For Great Britain there are about 15,000 of these sheets.

It may be asked, if, as is undoubtedly the case, the maps of the British Isles are finished for all these scales, why is there any longer any need for an Ordnance Survey ? The answer to such an enquiry would be the following : the face of the country changes rapidly ; towns grow in size; new roads and new railways are built; woods are cut down or planted ; boundaries are constantly being changed ; the coast line alters. A map of a well-developed area soon becomes out of date, and the old maps soon lose their practical value. It is, therefore,

necessary that all sheets, on all scales, should be periodically revised. Then, from time to time, the Government needs special maps for special purposes ; as instances there are those required for the Electoral Redistribution or for Land Valuation, or for Military Manoeuvres, or for the thousand and one functions of government. The Public has its special needs, which vary with the times : transport maps ; local government maps ; tourist maps ; archaeological maps. Then there are matters not directly connected with mapping, such as the Magnetic Survey, which is carried on continuously and enables mining engineers to use the latest values of that mysteriously changing phenomenon the magnetic variation ; and so on.

And now for a few words about the special relations between the Ordnance Survey and Archaeology. Ordnance Maps on their various scales do represent, with great fidelity, the visible features of the face of the British Isles. On the Irish maps will be seen the thousands of those ancient circular earthworks known erroneously, as ' Danes Forts '. Every visible one is there, each in its proper place, accurately drawn. And most interesting it is to study some of the sheets showing these many primitive fortifications. Similarly, in England, will be found marked the much larger, and more striking, but fewer, earthworks of the Early Iron Age, and some few of the earlier earthworks—all that are clearly visible will be shown. The same remarks will apply to the long barrows. But here, the aid of skilled archaeology is needed. There are mounds of doubtful ascription ; some are hardly recognizable, worn away by the action of time, or of mankind. There are other ancient earthworks that need a skilled eye for identification. There are customary descriptions which need to be changed, such as Druids' Altars. There are Roman roads difficult to trace. There are round barrows, barely visible, which the Ordnance Surveyor may mistake for natural features. And there are those traces of an ancient past, seen as it were, through a veil, dimly, from the air, to be reconstructed on our maps, although the earth-walker may not realize them. The task is clearly beyond the powers of the ordinary surveyor, who could never decide such matters, and must leave them to a higher authority. Such an authority was appointed to the staff of the Ordnance Survey some ten years ago, and the advantage of this appointment became immediately apparent. Order in archaeological matters is being introduced on our national maps. Priceless information is being preserved. All over the country a veritable archaeological survey is in progress, with the good will and help of experts in the

counties. Archaeological history-sheets are being kept of each portion of the surface of Great Britain, in the form of six-inch maps, with all verifiable information marked upon them, namely, the results of excavations ; the casual ' finds '; information from literary sources, such as the Saxon charters ; information from air photographs ; historical sites ; and everything recordable upon the maps, that may serve to throw light upon the past.

Another form of activity, initiated by the same authority, is the publication of a Map of Roman Britain ; maps of other periods are in preparation. Another illustration of the same wide outlook is the cooperation of the Ordnance Survey with the Surveys of most of the nations of Europe, in the preparation of a series of maps, of a uniform type, of the Roman Empire at the time of its greatest extension. All this will serve to illustrate the fact that if, as is the case, the Founder of the Survey, old Roy, put the study of archaeology high in the range of his interests and devotions, that science has, in recent years, fully come into possession of its rightful domain, as an integral part of the operations of that same Survey. And this is, under the benevolent control of successive Directors of the Survey, largely due to the energy and ability of the aforementioned authority, whose name the Editor of this Journal might not, perhaps, permit me to mention.

The Chiltern Grim's Ditches

by O. G. S. Crawford

QUITE a long time ago the Editor received an article on certain linear earthworks in Oxfordshire and Buckinghamshire. The author, Mr M. W. Hughes, developed a reasoned hypothesis to account for the facts, basing his argument on the assumption that the course of the ditches marked on the Ordnance Maps was as correct and complete as possible. It seemed desirable, however, to test this in the field, and the Editor therefore applied to the Archaeology Officer of the Ordnance Survey, with very satisfactory results. The course of each ditch was followed on foot, and its characteristic features recorded on the 6-inch map. The investigation thus initiated was carried on until nearly all the Grim's ditches of Wessex, and some others as well, had been traced. The information thus obtained proved to be of considerable value ; many miles of new entrenchment were discovered, and these will be incorporated on the new (5th) edition of the one-inch Ordnance Map now being prepared, and will also appear in due course on the Ordnance Map of Anglo-Saxon Britain, now in preparation. It also became evident that the name Grim was attached to at least two quite distinct types of entrenchment. The date of each can, as a rule, only be determined by means of excavation ; some of these examined are probably prehistoric ; others fall probably within the extreme limits of the years A.D. 350–700. Those dealt with in the present article are almost certainly either late Roman or Saxon. It is not, however, the object of this article to discuss their age or purpose ; that is done by Mr Hughes in the article we shall publish in our next number. What is now designed is to give a straightforward account of the existing remains of the entrenchments dealt with by Mr Hughes, so as to clear the ground and make his hypothesis more easily intelligible.

It may be said at once that field-work failed to add any appreciable amount to the course of the Oxfordshire and Chiltern ditches ; in fact it had the opposite effect. For five miles of the South Oxfordshire ditch proved to be imaginary !

Of those dealt with here, the first is included for completeness, although it is not mentioned in Mr Hughes's paper.

The ditches are as follows :—

1. The Aldworth Grim's ditch and the detached portions which presumably belong to the same system.
2. The Mongewell (or South Oxfordshire) Grim's ditch.
3. The Chiltern Grim's ditch, probably once continuous but now found in four stretches with gaps between them:—
   - (a) near Hampden
   - (b) running eastwards and northwards up from the Missenden Valley to the Lee
   - (c) from King's Ash, north of the Lee, in a curve through the parish of Wigginton, to a point west of Berkhampstead
   - (d) on Berkhampstead Common.

1. The Aldworth Grim's ditch

(Berks 27 NE, 28 NW)

This ditch, or rather system of ditches, faces north ; that is to say the ditch is on the north side of the bank throughout. (All the others face southwest, south or east). Beginning at the west end the first certain trace is to be found in a field 300 yards south of Woodrows Farm. It runs through Beche Farm where it is well preserved. It makes a right angle bend northwards in Foxborough Copse and throws off a branch southwards at the point where it crosses the ridgeway coming from Hungerford Green. This branch, which I discovered accidentally, is not on the map; it runs for a little more than half a mile, ending in Beechcroft Shaw. It is to be seen along the southwestern margin of Portobello Wood and in the field immediately south of it, in which it makes a right angle bend northeastwards. The main line likewise comes to an end 300 yards to the NW, in an old hollow lane, near the head of a steep-sided valley running down to the Thames. Whether either branch originally continued must remain uncertain; there are at present no traces of any such continuation visible on the ground. The estimated vertical height of both branches (from west of bank to bottom of ditch)[1] nowhere exceeds 6 feet.

[1] Usually abbreviated as the ' CD vertical ', a term invented by Dr Williams Freeman; see his *Field Archaeology of Hampshire*, pp. 329–333. OH=Overall horizontal width.

Southwards, on Hart Ridge[2], is a detached fragment in Broom Wood and Bowler's Copse. The portion in Broom Wood is indicated as a bank by hachures but is not described by any name on the Ordnance Map, and has not hitherto been recognized as an antiquity. The western portion runs NE by E for 300 yards; it is in an excellent state of preservation, and has a CD vertical height of no less than 12 feet, and an overall width of 65 feet.[3] At each end this imposing rampart makes an abrupt turn and dwindles to the normal altitude of 5 feet. At the west end a stretch runs NW along the SW margin of Bowler's Copse and out into the field beyond, in the middle of which it is lost. (This portion has an overall width of 42 feet). It looks as if it continued to the main entrenchments a mile to the north, but I could find no trace of it over the intervening country. At the east end the big rampart and ditch are suddenly discontinued, and the gap so formed seemed to both Dr Williams Freeman and myself to be original. As in the Chiltern ditch near Hampden the gap occurs at an angle in the ditch, and it seems reasonable to suppose that it was left to allow for the passage of a road through the entrenchment.

The third and last unconnected portion consists of half a mile from the Thames westwards, in which direction it is best to describe its course. It is first seen going up the very steep slope above the Streatley and Reading main road opposite Grotto Lodge. (The line is continued to the Thames itself by a field-boundary, but Grim's ditch, if it persisted, is not now to be seen). It climbs 100 feet in 100 yards, and then turns and follows the top of a narrow ridge, forming the southern border of High Holies Wood. It then makes a slight turn and obliquely descends the southward-facing slope, falling 100 feet in 400 yards. Here at the bottom of a big valley it seems to end. This last sector is remarkable in that the ditch faces *up* a slope of 1 in 4 and cannot possibly have served any defensive purpose.

A glance at the accompanying map will show the relation of these entrenchments to certain ancient lines of communication. The western portions are all three of them drawn across the line of a ridgeway which continues that of the well-known Berkshire ridgeway ; and it

---

[2] Probably connected with the *hiorotlege* of the Bestlesforda (Basildon) bounds, *circa* A.D. 890 ; see Birch, *Cart. Sax.* II, 565, and Grundy, *Berks, Bucks and Oxon Arch. Journ.* XXIX, 203–6.

[3] These and the other measurements quoted here were made by Dr Williams Freeman, with whom these investigations were carried out during the spring of 1930.

seems not at all unlikely that the gap in Broom Wood may have been left for the traffic along it. So too the ramparts of the main entrenchment are duplicated where it crosses the line of the same road in Portobello Wood. Now this ridgeway has suffered severely at the hands of antiquaries of the last two centuries, who have thrust their theories upon even the Ordnance Maps, which they should not have done. Upon these maps the ridgeway is made to leave the downs at Streatley Warren, and to pass thence over the side of Thurle Down to the bottom of a *valley* which it follows for over a mile, ending meaninglessly at the Reading road, half a mile from the Thames and nowhere near a ford. This is all wrong, and the true course is perfectly plain. It keeps to the comb of the ridge all the way from Hungerford Green near Aldworth, past Upper Basildon, to Pangbourne where it crosses the Thames and becomes the Chiltern ridgeway.

The so-called West Ridgeway is another such figment invented in the 18th century. There are two outlying portions of the parish of Streatley called West Ridge and South Ridge, lying respectively west and south of the village. The road leading from Streatley to Westridge was called Westridge Way, and is so printed on old maps. The name has no other significance. There was no such thing as an independent ' West Ridgeway '.

The last, eastern, portion of Grim's Dyke bestrides the road which led from Dorchester (Oxon) to Reading. There can be little doubt that at this point the modern road coincides with the Roman road from Dorchester (Oxon) to Silchester ; northwards the course is quite plain, but south of this point it is lost. It seems reasonable to conjecture that just as in Saxon times Reading came to replace Silchester, so the traffic and with it the road was diverted eastwards until the southward continuation fell into disuse and at last completely disappeared.

That these above-mentioned ditches were to some extent intended for military defence may readily be admitted ; but this explanation breaks down completely in the face of such facts as we encounter in Holies Shaw. Here Grim's Ditch, after maintaining an admirable course up and then along the crest of a sharp ridge, commits tactical suicide by deliberately leaving a steep slope and descending obliquely to the bottom of a valley. It must have been done with intention, for any one of several alternative courses might equally well have been selected. The purpose however completely baffles me at any rate.

2. The Mongewell (or South Oxfordshire) Grim's Ditch

(Oxon 49 SE, 50 SW, 53 NW)

Although this and the succeeding ditches are dealt with separately here, it is not improbable that some at least of the component parts were originally connected by stretches time has destroyed. There is no evidence one way or the other; the intervening gaps have been searched but without result. It is in any case highly probable that the now disparate sectors all belonged to a single system. It is with this and the succeeding Chiltern Grim's ditch that Mr Hughes will deal in his forthcoming paper. I do not wish to anticipate his conclusions further than to state that he argues in favour of an early Saxon origin and construction.

The Mongewell intrenchment faces southwards. It begins, I think, not in the Thames itself, as is generally supposed, but at a large spring-pond in Mongewell called 'the Lake' at a point 600 yards east of the Thames.[4] This forms an excellent obstacle upon which to rest the right flank. Thence it runs in a direction slightly south of east and in an almost dead straight line for $3\frac{5}{8}$ miles to Nuffield on the top of the Chiltern ridge, 670 feet above O.D. For most of this stretch little but the bank has survived; both ditch and bank are, however, well preserved in the woods west of Nuffield. Here, at the head of a coomb, it bends sharply to the southwards for a furlong, then resumes its easterly direction for 500 yards, and then runs NE for the same distance; after which remarkable behaviour[5] it continues approximately in its former, east-southeasterly direction for a little over half a mile to Hayden Farm where it vanishes completely and does not reappear. I have walked over every yard of this last portion, from Nuffield to Henley, and have searched for it both along the course assigned to it on the Ordnance Map and in other likely places, but without finding any trace or hint of it. Dr Williams Freeman was equally unsuccessful. At present one can only conclude that it never went beyond Hayden Farm. It should be observed that Dr Plot,

---

[4] This is really Dr Williams Freeman's discovery.

[5] It is to be observed that this small almost rectangular salient occurs at precisely the point where the ditch is crossed by the Chiltern ridgeway; see map. This can hardly be accidental.

the first to describe it, did not see it himself east of Nuffield, nor does he mark it at all beyond this point on his map. He merely states that *he was told* it continued further.[6]

Though not what we want for the moment, the motley assortment of banks and ditches which some enthusiast has foisted upon the Ordnance Survey (53 NE) is by no means without points of interest. Across Highmoor Common runs Highmoor Trench, a pair of parallel banks 18 feet apart and quite evidently the remnants of an important highway of traffic. An examination of the large scale map makes it seem probable that this road was a continuation of an old road from London to Wallingford, whose course west of Marlow can be followed pretty easily on the map. At Fawley Court Farm it left the modern road, and crossing Henley Park descended in a deep hollow cutting to Lower Assendon, proceeding by the name of Bix Lane to Bix where it crossed the modern Henley-Wallingford road,[7] and thence to Highmoor Trench and Deadman's Lane. It was probably continuous with Howberry Lane which went over Nuffield Hill and down Brixton Hill to Wallingford.

The course outlined above was suggested solely by a study of the 6-inch Ordnance Map; it is often possible, from the detail of lanes and hedges here shown to infer the course of roads of no very great antiquity. In this instance the course outlined above was confirmed by a subsequent study of old maps of the district. Although doubtless still in use at a much later date over parts of its course, it seems quite probable that this may have been one of the oldest western highways out of London. It would be interesting to know whether it was in

---

[6] His actual words are :—' This *Vallum* or ridged Bank, now called *Grimes-dike*, . . . yet remains very high, but is but single till it comes to the Woods near *Tuffield*, alias *Nuffield*, where it appears double with a deep *trench* between '. Is this the record of his own observation or (as I should rather imagine) an inference from the name Highmoor Trench and from what he was told ? He never saw it east of Nuffield for he says : ' From *Tuffield*, I was told, it held on its course through the thick Woods, and passed the *River* below *Henly* into *Berk-shire* again, but the Woods scarce admitting a *foot* passage, much less for a *Horse*, I could not conveniently trace it any further '. *The Natural History of Oxfordshire*, by Robert Plot, 1677, p. 317.

[7] Which cuts through all boundaries and is for most of its course of quite recent origin. It had not yet assumed its present form when the first Ordnance Map was made in 1809.

use as a London and Wallingford road before Maidenhead Bridge, already built in 1297, was constructed.[8]

Whether the Mongewell ditch continued to Henley or not, it is certain, from documentary evidence to be cited by Mr Hughes, that *a* Grim's ditch existed there, though it has now completely disappeared.

The western portion of the Mongewell ditch is called Grimes ditch in 1220–1 in a bequest to Reading Abbey of land in Newnham Murren;[9] and on Davis's Map of Oxfordshire (Cary, 1797) it is called ' Grimes or Devil's Ditch '.

3. The Chiltern Grim's Ditch[10]

(a) near Hampden.

The first traces of this ditch are met with in Park Wood, on the high ground between West Wycombe and Lacey Green. It is quite well preserved in places and follows the line of the road most of the way to Lacey Green. It can easily be traced almost continuously through the enclosures and gardens there. Then, after a straight run of a mile and a half it turns and runs, again in an almost straight line, for just short of 2 miles, to the north corner of Hampden Park. Except for a break of 800 yards, where it has been used as a lane, it can be traced without a break over hill and dale. At the aforesaid corner is what looks like an original gap, with deeply scored traffic ruts.[11] At this point it makes the most remarkable change of direction anywhere observed, turning through slightly more than 90 degrees. It is at

---

[8] The construction of bridges, particularly those of Abingdon, Wallingford, Henley and Maidenhead, must have had great influence upon the course of main roads, and would form an admirable subject for enquiry. We know that the construction of Abingdon bridge in 1416 diverted the traffic to it from Wallingford where previously the London and Gloucester road had crossed the Thames. This must have diverted the Gloucester traffic to the Benson-Dorchester section of the Henley-Oxford road, thence to Abingdon by Burcot and Culham. The course of the old Gloucester road w of Wallingford is unknown. The building of the Seven Bridges road had great influence upon the roads into Oxford from the west. For Maidenhead, Wallingford and Abingdon bridges see Lysons, *Berks.*, pp. 268, 9 ; *Berks, Bucks and Oxon Journal*, April, 1907, XIII, 23–26 (' The Early History of Maidenhead Bridge ', by E. H. Young) ; Gough's *Camden.*

[9] Brit. Mus. Index to Charter Rolls, 1900, p. 314 [ADD. MS. 19615].

[10] Mr W. J. Hemp, F.S.A., who first observed this gap, also regards it as original.

[11] The Bucks Grim's ditch is described in Clutterbuck's *History of Herts.*, p. 8, note 1, by the Rev. Thos. Leman, a good observer, who traced it in 1795.

first perfectly preserved, and can be followed without difficulty to Hampden House, between which and the church a garden path runs upon its bank. It is continued on the northeast side of the drive where a row of trees stands upon the site of the bank ; the ditch (full of leaves when I saw it) is just visible, but may have been slightly modernized. Beyond the Lodge the bank again becomes visible for about 170 yards, then comes a break of about the same length, and then it reappears for about a furlong in Oaken Grove. Here two large mounds stand right upon its line. Dr Williams Freeman and I tried, by looking at them, to detect some clue to the relative ages of ditch and mounds, but we could see nothing. Other archaeologists have tried with no better results. Excavation would doubtless settle the matter, though excavation in a wood will not commend itself to the experienced digger. The mounds themselves may be prehistoric, Roman or Saxon; there is nothing in their external appearance to suggest which, though I do not think they are prehistoric. Another mound standing by itself about half a mile to the west (called ' Danes Camp ' on the Ordnance Map, Bucks 38 SW) is equally puzzling. Beyond the wood, southeast of the mounds, there is no trace of the ditch, though its line is continued by a footpath.

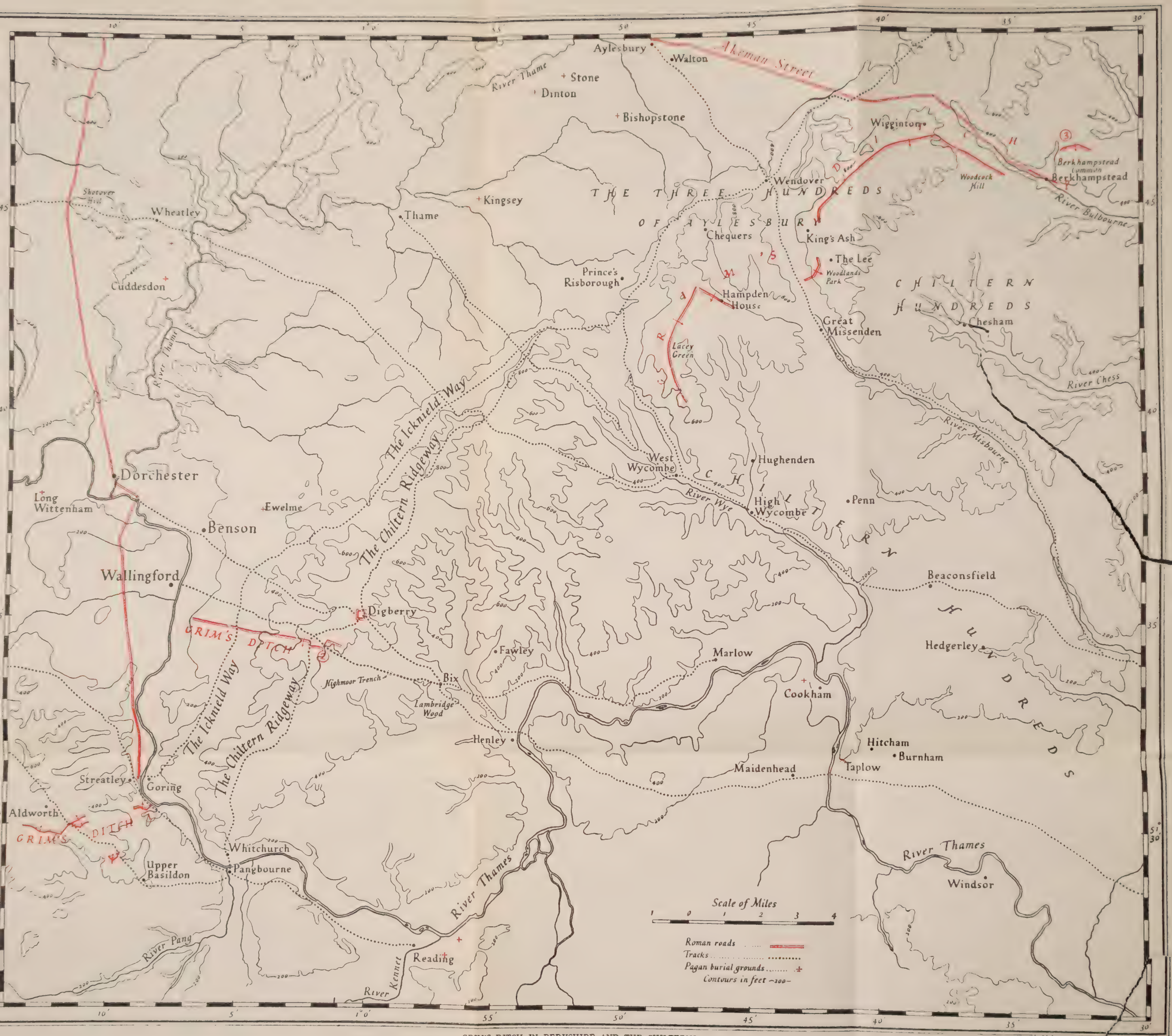
(b) running eastwards and northwards up from the Missenden Valley to the Lee.

Though it seems reasonable to suppose that this next sector was once continuous with the preceding, I have hunted the intervening country field by field in vain. The ditch is first seen in Woodlands Park, and it can be followed as it bends round northwards into the line of King's Lane. From the southern course of the lane to a point 300 yards further north on the east side it is quite plain ; then, for no apparent reason, it disappears.

(c) From King's Ash in a curve through the parish of Wigginton to a point west of Berkhampstead. (Bucks 34 SE, 35 SW [Herts 32 NW NE]).

The *line* is continued straight by King's Ash lane, which also forms the boundary between the parishes of Lee and Wendover ; but there are no certain remains of Grim's ditch until we get to Great Widmoor Wood and Mercer's Wood (in the extreme NW corner of Bucks 38 NE) along whose western margin it runs, due north and south.

I did not follow it across sheet 34 SE where, as I am informed by Sir James Berry, its course is plain, even where it is not marked on



GRIM'S DITCH IN BERKSHIRE AND THE CHILTERNS

facing p. 168

the map. It runs at first northeastwards and then bends gradually round eastwards ; finally it turns southeastwards in Harding's Wood, Wigginton (Herts 32 NE). I followed it between Hamberlin's Wood and Woodcock Hill in the parish of Northchurch. It may be followed almost continuously through fields and copses, though it has been destroyed in many places by modern diggings. The last certain signs I saw of it were between Woodcock Hill House and a small house called The Chalet.

(d) on Berkhampstead Common (Herts 33 NW).

Unless the name ' Graemes Dyke road ' in the southern outskirts of Berkhampstead has any significance, there are no traces to connect the portion on Berkhampstead Common with the previous sector. The course would have passed through Berkhampstead Castle : and the whole of the ground hereabouts has been so long and so intensively cultivated that it would be remarkable if any remains had survived. It enters the common from the west at the 500 foot contour-line, and it may be traced for a short distance into the field beyond by a belt of large flints and an almost imperceptible fold in the ground. On the common it is well preserved. About half way across it turns from ENE to ESE, and is crossed immediately afterwards by the modern road from Berkhampstead to Northchurch. It becomes difficult to trace before it leaves the common, and though I fancied I could detect signs of it on the Green at Potten End and even a little beyond, I saw nothing indubitable, nor did a somewhat rapid survey from the air reveal any clues.

A good deal of time in the field was spent in a vain search for traces of Grim's ditch in the intervening gaps already indicated. That no such traces were found does not by any means disprove their existence; others, especially those with local knowledge and opportunities, may well succeed. Nor does it prove that the sectors which are now discontinuous were originally discontinuous. Some of them were, in my opinion, almost certainly connected.

Whether, on the other hand the Mongewell (or South Oxon) Grim's ditch was once continuous with, or even whether it belonged at all to, the Chiltern Grim's ditch is another matter. Personally I should be rather surprised if it did not at any rate form part of the same system. And in this connexion I must mention a most remarkable discovery that Dr Williams Freeman and I made, purely by accident. We were

motoring along a lane at Park Corner, 2 miles NE of Nuffield (Oxon 50 SW) when we suddenly saw a large bank in a wood (Springalls Plantation). On consulting the map we found that close by was Digberry Farm, a name whose suffix had already aroused our suspicions. We stopped and examined it, and it proved to be a large almost square earthwork. Dr Williams Freeman's account is as follows :—

'The camp lies on the left hand side of the road going from Nettlebed to Cookley Green, which at this point forms part of the Chiltern ridgeway, and close to Digberry Farm. It lies on a level saddle between two Coombes on either side of the hills.

'It is of medium profile; CD. vert. 9 feet, OH. 53 feet, and contains some ten acres or so. It is of square form and is perfect only at the east end of the north side, the north end of the east side, for nearly the whole length of the south side, and a small portion of the west side at the southwest corner; but the southeast corner is quite plainly visible in the field on the east of the road and the northwest corner can easily be traced. At the northeast corner there is a heaped up bank on the counterscarp 3 feet high but with no recognizable ditch. The south end of the west side is pierced by an old disused road (Digberry Lane) going down to the low country, and from this point an annexe of approximately oval shape juts out and returns. This is much ploughed out and spread, the ditch is on the outside and the O.H. gives the impression that it must have been of much the same profile as the camp.

'The top of the bank is hard under foot and there is a large number of flints along it. There are several modern gaps in the bank but one on the eastern side looks as if it might be original—it is small and undefended.

'The soil is clay with flints and no chalk appears in the banks. The camp is in an open beech wood but part of the area is in grass—the natural condition would be scrub. The nearest springs would be a mile away at the foot of the hill. The lane was said by an old inhabitant to have been used by coaches within living memory and there are sayings about battles in old time.

'The camp is unrecorded and was noticed by Mr Crawford and myself from the road, the name Digberry Farm having suggested it'.

Several apparently significant facts are to be noted. First, it is placed exactly at the point where the Chiltern ridgeway crosses the old London coach-road. This fact might be inferred from the map, but I had already been told on the spot by a native that Digberry Lane

was supposed to be an old coach-road. Then, at this point the ridge itself is constricted to a narrow width by two valleys whose heads almost touch, having only a narrow space for the ridgeway. It is a ' nodal point ' of traffic ; and it is exactly where a fortified post connected with the Mongewell Grim's dyke would most suitably have been placed. There is already evidence of topographical association—no more as yet, but still even that is something—between large rectangular earthworks and linear earthworks, in the case of the Oxfordshire Grim's dyke (Callow Hill) and the Froxfield entrenchments (Ridgehanger). These two others *seem* to be Roman ; but neither has been excavated, nor has Digberry. There may of course be no connexion between Digberry and Grim's ditch ; but even so one would like, for their own sakes, to know something definite about one at least of these rare and by no means insignificant rectangular forts.

This concludes my account of the Grim's ditches, which are to be dealt with by Mr Hughes from another angle. I have to thank him for arousing my interest in what has proved to be a most fascinating pursuit. At the same time I investigated many others in the field—the Pinner or Middlesex Grim's ditch, which faces south ; the earthworks round St. Albans which are being excavated by Dr Wheeler; and a line of bank near Goff's Oak in Hertfordshire which vanished into thin air.[12] I propose to continue until I have examined all the others which require investigation.

NOTE.—The accompanying map has been drawn mainly to illustrate Mr Hughes' article, though I am responsible for the selection of the items marked. It seemed better to publish it now rather than in the next number, so that the descriptions given above may be more easily followed. They are based on the 6-inch Ordnance Map.

[12] See Clutterbuck's *History of Herts*, II, 78.

Inka and pre-Inka

by J. Leslie Mitchell

FEW of the standard Peruvian histories—much less those politico-fantastic tracts which hasty study of the Ancient Peruvian scene has evoked in such number—give any adequate idea of the tremendous cultural background against which the Inka civilization was built up, or of the fact that from that background emerge those archaeological exceptions which constantly question the theories of modern Americanists.

For example, no pre-Columbian American had any knowledge of the true arch ; but in an un-Inka portion of the ancient site of Pachacamac, near Lima, there was such an arch. The wheel was unknown in Ancient America ; but at Tiawanako, remote in the Andean Sierra near Lake Titicaca and long ante-dating the Inkas in origin, are stone discs which were almost certainly used as wheels for the transport of gigantic building stones.[1] The Mayan glyphs apart, there was no true script in the two American continents at the time of the arrival of the Europeans ; but the sculptured stones of Sahhuayacu bear recurring symbols which cannot well be identified as anything else but inscriptions.

The list is not by any means complete. But these exceptions remain exceptions. Neither the Pachacamac arch nor the Tiawanakon wheel occur elsewhere ; the evidence for the authenticity of most so-called Peruvian inscriptions is negligible. Unexpected phenomena erupt upon the scene of much cultural activity, but bear no influence outside their own epoch or locality. Though the most recent, the semi-civilization of that confederation of tribes on whose territory Pizarro's Spaniards set foot in the year 1533 was not in every respect the highest in Peruvian attainment.

Yet, as the Aztecs succeeded in leaving their name posthumously superimposed on nearly everything Mexican and Central American, so in South America the unfortunate misnomer ' Inca ' is still generally applied to both the survivors of the ancient populace and the ruins of the ancient cultures. So deep-rooted is the name that even the Americanist abandons the attempt to fit the Andean and littoral civilizations with a more correct terminology, though ' Inca ', 'Sacsahuaman',

[1] A. H. Verrill, *Old Civilizations of the New World*, 1929.

'Uiracocha', and the like euphonious familiars have given place to the clumsier if more correct 'Inka', 'Saksawaman', 'Wira-Kocha'.

Whatever the actual origin of its ancient inhabitants, South America is now peopled by three distinct theories. The first, and most generally accepted, brings tribes of proto-Mongolian stock across the Behring straits, through North America, and into Colombia by way of the Panama neck. The second, championed by Captain T. A. Joyce,[2] varies this first theory by deriving the wave of long-headed peoples—as distinguished from the later Mongoloid round-heads—from Europe by way of Greenland. The third hypothesis, much in favour with modern archaeologists who are themselves South Americans, finds overwhelming proofs of the continent having been settled by successive incursions of Melanesian and Polynesian immigrants.

The remains of the long-headed race or races form the lowest cultural stratum on the Peruvian coast. Shell-fish was their principal food. Maize-growing, and probably all forms of agriculture, were unknown. Weapons were made of shell and bone; the stone implements are definitely palaeoliths. It is improbable that these strayed Europeans or Melanesians flourished at a period remoter than 10,000 B.C., although one investigator considers the much more recent Tiawanako ruins as 'about 10,500 years old'![3]

So far as Peru is concerned the round-heads, Mongolian or Polynesian, appear to have made their first appearance in the region of the Andes. They evicted or exterminated the long-headed peoples and settled down to witness or originate those adventures in civilization with which this paper is concerned.

The North Pacific coastal strip of South America consisted and consists of flat and sandy desert, traversed from east to west by occasional rivers. Behind this was the Andean Sierra, some 250 miles in breadth and 1400 miles in length, a jumble of interlocking mountain chains interspersed by fertile valleys at considerable elevation. Still further to the east, beyond the Sierra, lay the Montana, the region of tropical forest drained by the Ucayli and other tributaries of the Amazon. Originating from one of these regions, or from all three, there arose in the first millennium before Christ a culture that, with the customary exceptions, appears to have been roughly homogeneous.

---

[2] *South American Archaeology*, 1912.

[3] A. Posnansky, *Guia general ilustrada para la investigacion de los monumentos prehistoricas de Tihuanacu, etc.*, 1912.

This culture was characterized by an ability to work textiles with considerable skill and to produce pottery, plain and polychrome, ranging from utensils of the crudest technique to unutilitarian vessels of great beauty. It cultivated maize. In the Andes, at least, it had probably already domesticated the llama. It is doubtful if, in its early phase, it was acquainted with the use of metals. On the coast and in the coastal hinterland, at such sites as Parakas, Chawin, Aija, Wari, Supe, Changoyape, it built its temples and perhaps its dwelling-houses ; in the Sierra megalithic stone buildings, the stone roughly cut but fitted with some skill, were reared. Both on the coastal strip and inland it excavated elaborate communal burial-places, erected great pyramidal structures, and carried on terrace-agriculture. Mummification was a practice in the coastal sites, but unknown inland until late in the epoch. Sierra sites, such as Yayno, were elaborately fortified. Somewhere towards the end skull-deformation and primitive trepanning were known on the coast.

To judge by the mummies disinterred in 1925 from the underground necropolis of Parakas, the possessors of this culture were of medium stature, slight in build, and relatively of poor muscular development—characteristics certainly not shared by the later Keshwa and Aymara of Peru. Sr. Tello,[4] somewhat irrelevantly, notes a predominance of female burials, and ' an apparently low infantile mortality '.

Again (disregarding such apparently unwarranted speculations as those of Sr. Posnansky, who believes that the Chinese may have reached the Peruvian coast as early as 2000 B.C.) three theories attempt to account for the origin of this culture of the first epoch. Dr Max Uhle[5] believes Peru was profoundly influenced at an early date by the diffusion of Mayoid influences from the coast; most Americanists, at least until recently, postulated the Andean valleys, if not the forested slopes of the Montana, as the birthplace of the first efforts to cultivate maize and build rude fortresses ; the ' Pacific school ', with some vagueness as to its datings, brings the culture from Polynesia or Polynesised Asiatic sources.

Dr Uhle's case, formulated after his inspection of the basurales of Ancon in 1904 and strengthened by his subsequent investigation of other sites, still appears factually impregnable. Certain ceramic remains of the first epoch, and nearly all the crude sculpture that has survived, have definite affinities in design and technique to the arts

[4] *Antiguo Peru*, 1930.

[5] *Influencias mayas en el alto Ecuador, etc.*, 1922.

TUMBEZ
RIO TUMBEZ
TO CENTRAL AMERICA
R. AMAZON
N
R. MARAÑON
ANDES
R. HUALLAGA
R. UCAYLI
MONTANA
CHONCOYAPE
CHAVIN
AIJA
SUPE
LITORAL
PACIFIC OCEAN
ANCON
(LIMA)
PACHACAMAC
WARI
SIERRA
R. PAUKA
R. APURIMAC
R. TAMBO
CUZCO
CHUNTAY TAMPU
PUKARA
LAKE TITIKAKA
TIAWANAKO
PARAKAS
RIO ICA
RIO GRANDE
NASCA
TO EASTER ISLAND
ARIKA
ANCIENT PERU

of the Maya Old Empire. This cultural influence presumably came by sea from the Panama region and was diffused southwards and eastwards from the Ecuadorean littoral.

The time element, however, may be seriously questioned. It is extremely improbable that the race which reared the civilization of the Maya Old Empire appeared on the remote Central American scene before 200 B.C. The culture of the Peruvian first epoch, on the other hand, was undoubtedly well under way by 500 B.C. Dr Uhle's ' Mayoid ' immigrants may have modified and enriched that culture. But they did not originate it.

The arguments of the school which considers the culture indigenous and its sponsors the archaic Andeans, may be summarized briefly : The systems of cultivation found on the coast are obviously adaptations of a system—terrace agriculture—suited to mountainous country. The characteristic Andean granary descends to the plains without warrant of necessity : it was an unimaginative importation of the plains-men. Natural mummification is a possibility on the high, dry Sierran valleys, and so must have suggested the elaborate artificial embalmments. The first epoch culture is not a phenomenon sharply localized in the region of Peru—one or other of its characteristics is found over wide stretches of the Montana and of the regions to the north and south. It was a concentration and fortuitous grouping of slowly evolved talents and abilities inherent in the American Indian—a concentration which spilled its achievements coastwards. It was an evolutionary point, not an alien importation. In the words of Dr Daniel G. Brinton[6] ' the culture of the Andean race is an indigenous growth, wholly self-developed and owing none of its germs to any other race '.

As will have been noted, the discoveries of Dr Uhle at least partially invalidate such statements as Brinton's. But the ' Pacific ' school, composed of both orthodox and heterodox diffusionists, goes much further. Parakas, the peak of the culture of the first epoch, is on the sea-coast. In the great necropolis of Parakas the art of mummification is found practised in its most perfect form ; it is practically unknown in the Andes. Parakas and the littoral generally are supreme in the textile and ceramic arts ; so far from having inherited and developed Andean culture, the converse took place. The strata of cultural remains in coastal sites give no evidence of slow evolution from lowlier forms—the crudest pottery often overlies the highest achievements

[6] *The American Indian*, 1880.

in ceramics. Pyramid-building, and the practice of rearing temples on the summits of those pyramids, is altogether inexplicable except on the theory of trans-Pacific importation. The methods of maize cultivation, and the very quality and size of the mummified maize-heads discovered, argue experimentation with an unfamiliar food-plant by skilled agriculturists. The fact that nearly every inland settlement of the early culture was intensively fortified is explicable on the grounds that the settlers and builders were aliens in a hostile or semi-hostile country, surrounded by tribes of the indigenous Amerindian population.

The theories of these last two schools are therefore in flat contradiction. Each, selecting arguments from the archaeological discoveries of the last three hundred years, can score points unendingly against the other. To the unprejudiced observer the point of view championed is apt to seem largely a matter of temperament. Neither the hastening activities of the diffusionists' primitive prototypes nor the arid exclusiveness of the ' Andean ' school's ancient protegés seem capable of fully explaining the facts.

This, indeed, is to admit, if only by implication, that the belief in American cultural isolation is no longer tenable. For over a century, in spite of the eruption of occasional heretics, such belief has been propounded as an article of faith in American archaeology. The articles appear in need of revision. Disregarding the fact that the Peruvian cultures appear to have been at least partly local—*i.e.* Andean—in origin, it seems no longer possible to deny the play of both Central American and extra-American influences from the Pacific seaboard.

Despite Sr. Posnansky and a host of predecessors it is improbable that South American shores ever witnessed the arrival of junk-loads of Chinese or Japanese colonists. An occasional ship, so manned, may have drifted eastwards and southwards across the Pacific, but the survivors of its wreck, provided they escaped instant massacre, could have left but little impression on either the arts or social customs of the natives. The same applies to seacraft from India or Java. Nevertheless, both the Pachacamac arch and the Tiawanakon wheel, as well as other stray driftage of civilizations seemingly un-American, may have been reared or fashioned under the direction of such castaways from the distant east. They may have been used or admired for a generation and then forgotten together with their freakish originators.

Strong racial and cultural influences could have reached South America from only the Polynesian islands—from Easter Island, or,

more improbably, from Samoa or the Society Islands by way of the Marquesas and Galapagos groups. And these influences, to account with any plausibility for the alien characteristics which appear in the first Peruvian epoch, must have been brought to bear long before the Polynesian settled down to evolve the unambitious culture of the Oceanic islands—they must have been brought to bear while the Polynesian was still a sea-faring Asiatic.

Here it is necessary to define the scope of the word ' Polynesian '. As was noted earlier in this paper certain Americanists derive South America's brachycephalic second wave of human colonists from Polynesia. But that ' colonization ', if it ever took place, was in an era long before the appearance of the Peruvian first cultural epoch's beginnings. The historic Polynesians, according to the theory worked out in detail by Messrs Percy Smith, A. Fornander, and A. C. Haddon, and supplemented and enlarged by Dr W. H. R. Rivers, were Aryans who welled forth south-eastwards from India in a variety of slow-spreading streams, and at a period not prior to 400 B.C. In the course of several centuries the first group, passing beyond Java, peopled the islands fringing Oceania and ultimately settled in Samoa and the Tongan cluster. The second almost re-traversed this route and were the first settlers of New Zealand. Still a third racial group appears to have held to the northeast and east, settling Hawaii, the Marquesas, the Society and Austral Islands, and, finally, Easter Island, Oceania's furthest eastward outpost.

No accurate datings are possible for the sea-going adventures of these uprooted Aryans. Hawaii and Easter Island, separated by wide stretches of ocean, may have been reached as early as the beginning of the Christian era, or even earlier. While the mysterious culture-bringers of the Maya area were carving their first stelae in the plazas of Copan two thousands miles to the north of Parakas on the Peruvian coast, Parakas itself may have seen the crab-sail of the first Polynesian war-canoe rise over the western horizon.

The once-cogent arguments against South American culture having been influenced from the Pacific were threefold : Polynesian craft were incapable of such lengthy voyages as that from Easter Island to the Peruvian coast ; had these Asiatic Polynesians reached America in any number they would undoubtedly have brought their characteristic food-plant, rice—which is absent even from Polynesia and makes doubtful the Asiatic origin of the Polynesians ; had these Asiatic influences passed through Oceania to America the ceramic art would

not have remained as completely unknown in those islands as it was prior to the arrival of the Europeans.

But Polynesian seamanship appears to have been of much higher quality than was once thought. The voyage from Hawaii to the Marquesas (of considerably greater distance than that from Easter Island to America) was common in the Pacific of the ninth and tenth centuries at least; so from Hawaii to the Society Islands, an even greater feat. There can now be little doubt but that the rice-plant was known to the Polynesians, but was abandoned in favour of the bread-fruit, cuttings of which were carried from island to island ; in America they may have abandoned the bread-fruit in favour of maize with a similar ready adaptability. Pottery-making was not unknown in the Friendly Islands, New Caledonia, Fiji, and the New Hebrides, though the making of it generally appears to have lapsed for lack of suitable material ; there was no such lack on the Peruvian coast. The same applies to working in stone. In most of the Pacific islands stone-work is superfluous ; trees are plentiful and in gigantic sizes. But in such localities as Easter Island, where timber was scarce but workable stone plentiful, the Polynesian readily returned to the ancestral crafts of megalithic terrace-work and statue-carving. Similarly, while he found adobe convenient building material on the Peruvian littoral he was no less ready to abandon it for stone-work in Tiawanako of the Sierra.

By the end of the first or second Christian centuries, therefore, it is probable that Polynesian leavenings, both racial and cultural, had profoundly altered the character of the semi-civilization of the first Peruvian epoch. No legend or tradition of the clash of Andean and Oceanic wanderer survived into later times. Possibly the two races intermingled peaceably ; more probably, to judge by the ruined fortifications of so many ancient sites, a long period elapsed before the alien identity of the invader was forgotten by Andean and invader alike. Yet, in the third or fourth century A.D., when the ' Mayoid ' tribes descended on the coasts of Ecuador, it is probable that the descendants of the Polynesians had not only abandoned sea-roving and lost the art of constructing the great canoes which had brought them across the Pacific, but that they were indistinguishably fused with the aboriginal Amerindian populace, with Tiawanako and such-like sites being reared as the cultural efflorescence of that fusion.

The rise of the ' Tiawanakon culture ' appears to mark the end of the first epoch and the beginning of the second. With or without

external aids—apart from the slow-spreading memory of the great Maya civilization now in eclipse in Central America—the nameless Peruvian tribes had begun to rear immense megalithic structures, with but little resemblance to the buildings of the first epoch, from one end of the Sierra to the other. Round such centres as Cuzco, Ollantay-tampu, Tiawanako, and the two towns built of porphyry a few miles from Nasca—two mysterious sites in a region otherwise content with adobe—there must have been dense populations under the control of some central authority or authorities. There is a far-fetched possibility of a pre-Inka political empire. The art of working in metals was coming into being. The art of stone-working had passed—indeed, leapt—from a stage when the mason handled his material tentatively to one in which he moulded it to his purpose as though it had been clay.

Tiawanako is the crown of the second epoch's culture, is indeed the greatest engineering and architectural achievement of Ancient Peru. It is built near the southern shore of Lake Titicaca, 12,000 feet above the sea. The purpose of its ancient builders in rearing such an immense town in the bleak uplands of the Sierra can only be guessed at ; and there has been no lack of guessing. The main ruin is a huge, flat-topped rectangular pyramid of earth, covering nearly a square mile. It was originally ' stepped ', with each terrace faced with stone, supported by stone walls, and overbuilt with stone houses. In its heyday it must have presented such appearance as few structures in either the New World or the Old. By day it must have dominated the lake and Sierra like a magic city of the clouds. Lighted at night, its appearance could have been scarcely less impressive. Probably it was built to impress. Tiawanako itself may have been a holy spot, a city of pilgrimage.

Besides the ruined mound there are rows of rough pillars which may once have supported the roofings of palace or temple ; portions of stairways climbing nowhere ; detached monolithic doorways ; litter and debris of buildings unclassifiable, and much assisted to their present state by the operations consequent on laying a railway-track through the ruins. Gigantic statues formerly existed among the ruins, according to Cieza de Leon. But they have disappeared, as have the relief-carvings on the slabs of Ollontay-tampu.

Great blocks of trachyte, admirably cut and faced, and many of them weighing several tons, were used in the major building feats of this metropolis in the hills. The architectural skill was considerable, though dull and unimaginative; the stone-cutting remained unsurpassed

throughout the American continent. Lacking direct evidence, and aware of the feats which the Ancient American could perform with stone tools, the conservative archaeologist hesitates to ascribe the use of metal implements to the builders of Tiawanako. Others do not hesitate. With the disappearance of the stone statues reputed to have decorated the site, consideration of the sculptural technique and abilities of the Tiawanakon is reserved for the much-described Puerta del Sol.

This remarkable monolithic doorway, through which so many fantastic theories have passed to test the credulity of the archaeological world, is portion of a vanished wall and possibly of a vanished, flat-roofed building. It is a little over 13 feet long, is 7 feet above the ground, and 4 feet thick. The actual doorway is 4 feet 6 inches high by 2 feet 9 inches wide, and above it is a central figure in relief with on either side three rows of subsidiary figures.

This is the one important piece of sculpture of the second epoch. Compared with anything Central American the technique is poor. But there are points of resemblance, and it is possible that the 'Mayoid' influences had reached Tiawanako. Identification of the central figure, his satellites, or the meaning and purpose of the complete sculpture remain doubtful. Representations, both naturalistic and anthropomorphic, of the jaguar and condor are plentiful in pre-Inkan Peru of both the first and second epochs. It is presumed that these personifications of the terrifying and destructive forces of nature were the principal gods of both the Sierra and the littoral; if so, the Andean gods completely subjugated the deities of the Polynesian invaders. Wira-Kocha, the Jaguar deity (who survived with considerable prestige into the time of the Inka Confederation itself) is presumed to appear in humanized form as the central figure above the Puerta del Sol. But there are only slight resemblances between this figure and the undoubted Wira-Kocha of Chawin. The Tiawanakon god, if such he was, bears far more similarity to the statues of Easter Island or the figurines of Fiji.

Sr. Tello places the year A.D. 1200 at the end of the second epoch. But long before then Cyclopean Tiawanako and kindred sites appear to have been deserted. Power and importance probably passed to the cities of the littoral. The tide of Peruvian culture now rose, now ebbed, in this region and that. At Pachacamac the first layer of pottery remains above that identified with the 'Tiawanakon culture' gives distinct evidences of cultural retrogression. But the next stratum—

the famous white-and-red painted black ware—is on a par with any product of the early artists. Invading tribes of barbarians from the Montana may have overflowed the Sierra and broken up the ancient empire or group of principalities which had reared the architectural lustres of the second epoch. In the north, among the Chibchas and Manabis of Ecuador, the art of working all metals except iron was brought to a high degree of proficiency, and gradually spread southwards. Textiles of great beauty continued to be woven. The jeweller and potter found leisure and security for the carving, polishing and slip-painting of masterpieces. The people tilled the terrace plantations around their villages ; worshipped the innumerable totems of the village, except on such days as were set apart for adoration of the ancient condor and jaguar deities ; helped to repair or more frequently saw lapse into ruins the pyramidal temples reared a thousand years before by the wanderers from the Pacific ; joined in wars or forays under the leadership of petty chiefs. But the average tribesman was probably of a singularly peaceful disposition. War as a skilled science had yet to come to the country. Lacking a script, the country lacked history. No evidences of the imported Mayan astronomical and mathematical sciences survived the epoch ; possibly they were never imported, or perished early in an unfamiliar milieu. Prior to the twelfth century it is impossible to identify definitely any locality with the later historic tribes.

In the twelfth century, however, the picture clears with the eruption of the Inkas upon the scene. Peru is disclosed as divided into three, or perhaps four great tribal groupings :—dominating the coast, from the city of Chan Chimu, was the ' kingdom ' of Chimu, probably the most highly civilized tribe in South America, and with definite Mayan affinities ; mid-way the littoral and Sierra were the Chancas ; south of them, the Keshwas. Whether these are to be regarded as racial or linguistic classifications is not yet by any means clear, nor whether the Aymara, based on Lake Titicaca, were a separate grouping, or a ' modification ' of the Keshwas.

But the Peruvian scene was prepared for its social, if not its cultural, culmination—the domination of the Inkas.

The modern view of 'Inka'—that it was neither a racial nor a tribal name, but the designation of an extraordinarily energetic theocracy at the head of a typical Keshwa tribe—was not held by the Inkas themselves. The Inkas were confirmed diffusionists of the Manchester school. Their first ancestors, Manko Kapak and his sister-queen,

Children of the Sun, descended on the mountains near Lake Titicaca. From that region, after various vicissitudes, their descendants set out on the mission of conquering and civilizing Peru of the third epoch.

Myth and legend apart, they appear in history as the rulers of a Keshwa confederation in the hilly country lying between the Rios Apurimak and Paucartambo. They occupied the ancient sites of Cuzco and Ollontay-tampu. Southwards, they conquered the Collas (Aymaras) of the Titicaca plateau, then turned their arms northwards and towards the coast. By the time of the coming of the Spaniards they ruled unquestioned from Central Ecuador far into the heart of modern Chile. Round about the year 1430 Paramonga, the great fortress of the Inkas' most dangerous rivals and cultural superiors, fell, and the ' Kingdom of Chan Chimu ' was dissolved.

This wholesale conquest was a feat unprecedented on the American continent, and its consequence—the organization of the extraordinary bureaucratic empire of the Inkas—the most interesting experiment of its kind ever attempted on any continent. Some knowledge of this experiment is common property—indeed, still awakes amazingly unwarranted passions in modern political references. It is almost needless to say, however, that its approximation to any recent realization of socialism, communism, fascism or the like was excessively remote. It was a theocratic feudalism, either ' an abrupt and entirely revolutionary order of things, exactly as though the laws, customs, arts, sciences, industries and social organization of the new régime had been brought ready-made and fully-developed from another sphere or unknown land ', to quote Mr Verrill, or ' not state communism, imposed on the people from above, but a family communism, evolved by the people from below, which the Inka state adapted to its imperialistic purposes as best it could ', to invoke Mr W. M. MacGovern, who champions the opposite point of view.[7] It equipped its highly-disciplined armies with copper and even bronze weapons—the first American troops so armed in any number ; it possessed a high technique in stone-cutting and architecture, using the parallelogram block, rearing great palaces and temples, but eschewing even the corbelled arch in favour of thatched roofings. It excelled in weaving and dyeing, and in some respects almost excelled the ceramic arts of the coast. It superimposed the worship of its own sun and moon gods on the primitive totemism of the Peruvian tribesmen, and tactfully identified

[7] *Jungle Paths and Inca Ruins*, 1927.

its own thunder deity with the ancient Wira-Kocha. Its empire of the Four Governments, Tawantin-Suyo, was ruled, with the aid of an efficient civil service, by an elaborate hierarchy, at the head of which was the Inka himself, below him the four Viceroys, below these the rulers of thousands, below these the rulers of hundreds and tens. It was unacquainted with poverty, tyranny, trade, or individual liberty ; it controlled every detail in the life of the ordinary citizen—his schooling, his mating, his work, his superannuation. It flung great megalithic roads to north and south of Cuzco into the territories of the barbarians, and marched its disciplined armies ever deeper into those territories on missions of conquest and civilization. It loomed divine, impregnable, unassailable in the eyes of the South American Indian ; it met the invasion of Pizarro's Spaniards in 1533 with cowardice and indecision and fell to pieces without any such gallant resistance as that displayed by either the Aztecs and Yucatecan Maya or the wild tribes of the Peruvian Montana.

Its swift débâcle in encounter with an unexpected invasion seems the best proof that it was indeed an alien importation, no evolution ' from below '. Yet, apart from its extraordinary administrative ability and its jealous sun-worship there is nothing fundamentally un-Peruvian in its nature. No doubt it descended on central and northern Peru while the local tribes were far sunk below the cultural level of the second epoch at its best ; but it is possible that its ' culture-rulers ', the eponymous Manko Kapak and his followers, were survivors and heirs of the high Tiawanako civilization and did but carry a modification of it across the Sierra. Astronomy, the calendar, sculpture, as in all previous South American civilizations, were at a low level ; a script was non-existent—its place being taken by the ambiguous quipos, or knotted strings, as mnemonic aids. There was nothing fundamentally un-Peruvian in its nature, it may be reiterated, except its two outstanding characteristics.

Whether these came from extra-American sources, like earlier ingredients of South American culture, is a matter never likely to be decided. But there are few certitudes in archaeological research, and the investigations of German and Peruvian scholars now proceeding at both coastal and Tiawanakon sites may yet bring definite evidence for or against some ripple from that final wave of Rivers' kava-drinking, metal-using people having washed across the Pacific to add its ingredients in rearing the glories of Tawantin-Suyo.

Sleds, Carts and Waggons

by Cyril Fox

Director of the National Museum of Wales

WHILE engaged in field work near Llanbister in Radnorshire, the writer saw by the roadside, near a country wheelwright's shop, a remarkable vehicle the like of which he had never imagined. On being questioned, the wheelwright said that it was a 'wheel-car' and was of a standard type used throughout the Radnor forest area (and indeed, as was afterwards learned, throughout the central moorland of Wales). It had been made entirely by himself and his smith. He drew attention to a second example, half completed, in the shop. This was purchased for the Welsh Folk Collection of the National Museum of Wales.

The Wheel-car

The special features of the wheel-car are shown in the photograph (plate 1). These are (a) the great length (13.6 feet) of the body in proportion to its breadth (3.2 feet); (b) the position of the axle-tree *above*, not below the main beams of the frame; (c) the bumpers attached to these main beams at one end—the *front*—of the wheel-car; and (d) the embryo cart structure—standards at each corner, rails opposite the wheels, and cage forward. The bumpers are shod with iron: other interesting details are the slightly-dished, ten-spoked wheels also shod, with five iron strakes (not hoops) centred on the joints of the felloes and affixed with wrought-iron nails with large square-crowned heads[1]; and the hubs, of a pattern formerly widespread but rarely found in 20th century work.

[1] Sturt, *The Wheelwright's Shop* (Camb. Univ. Press, 1923), p. 146, notes that hoop tyres had replaced strakes in rural Surrey sixty years ago. It is of the highest interest to find an elaborate technique of high antiquity the obituary notice of which, in a home county of England, has been written, still flourishing in Wales, and, it may be added, in the Welsh Marches. Large nailheads are a medieval survival. Cart-wheels with triangular headed nails may be seen in an illustration in the Louterell Psalter, f. 162A. Mr G. J. Abell, moreover, in a letter to the Editor of Antiquity, says that in Devon the cart-wheels were formerly 'studded with triangular pointed nails . . . so destructive to macadamized roads that their use was prohibited in 1822'.

One horse is harnessed to the car, by chain traces, and when it is being drawn along a level metalled road, as the writer first saw it, it would be difficult to conceive of anything more clumsy or less likely to have any survival value, for the iron-shod bumpers strike the ground at intervals. The wheel-car however, was not made for the roads of civilization, but for rutted byways and for mountain-side transport. Under such conditions, loaded high with hay, or fern for bedding, it is seen to be an excellent example of high specialization, of adaptation of means to ends. The bumpers act as a brake on steep slopes; the position of the axle-tree, primarily necessary to keep the body of the vehicle low for braking purposes, ensures smooth clearance if the wheels sink deep, and reduces the risk of a sudden jar on rocky outcrops; while the form of the body fits the narrow trackways, sometimes deeply eroded, of this difficult land.

A hill farmer in Radnor Forest, who has all his life been using wheel-cars, told me that although apparently clumsy it was for a skilled man by far the best vehicle for mountain country, and that it was rapidly going out of use because the younger men on the farms would not take the trouble to learn how to use it properly. Since, moreover, I have been informed that road surveyors object to wheel-cars on metalled roads because of the damage they cause, we may expect that converging pressures, psychological and economic, will erelong result in their complete disuse. It will be a pity.

The possession of so unusual a vehicle provoked enquiry as to its origins. The fact that it is attached to the horse by traces, and that the bumpers are at the fore-end, suggested that the primitive and early form may have been a sled, dragged along by ox or man by means of ropes. The sled is still used in the mountainous parts of central Wales, and two types are illustrated from Montgomeryshire. My colleague Mr Iorwerth C. Peate, who kindly supplied the photographs,[2] points out that type A (plate II) is ' not generally tilted upon the runners, but the farmer—who invariably fits on the new runners and often makes the sled himself—can shape the pegs to take the sled at any angle which suits his land best. For instance, if most of his carting is up-hill, the body of the sled will be tilted as in the photograph. But in most cases the runners are fitted close to the body. This sled is used for all farm cartage, and for harvesting hay, oats, barley, etc., fern and peat.

[2] I gratefully acknowledge the help I have received from Mr Peate in working out the history of cart types in Wales.

It is to be found on all upland farms in the Llanbrynmair district today, and is considered far more useful than any cart'. Type B (plate III), is used for carting wood, gorse and such materials as cannot be carried easily in type A. The runners are attached in the same way as in the latter. Since both vehicles, Mr Peate adds, 'are what was described to me by a farmer as "dead weight", there is no great danger of their sliding on to the horse's hoofs even on steep slopes, but they are generally braked when necessary by placing a piece of wood (*any* piece!) attached by chains crosswise under the front of the runners. The sled is then under perfect control'.

There is obviously a wide gap between these sleds and our wheel-car, and on the evidence hitherto presented there is nothing to connect them. The vital link, however, exists, in the shape of the wheel-sled.[3] This interesting type is illustrated (plate IV) by an example now in use at the farm of Brynaerau Isaf, Llanbrynmair, Montgomeryshire. The wheel-sled is similar to the sled, except that the runners extend from the front for a short distance only, and that at the rear end two wheels are attached, 'sometimes of wood, but now generally of iron'. These wheels are locked for braking.

The evolutionary history of the wheel-car is clinched by a literary record. Walter Davies mentions in his *General View of the Agricultural and Domestic Economy of South Wales*, published over a hundred years ago (in 1815), that at this time the wheel-car had 'low wheels' (*i.e.*, small solid wheels) on an underslung axle.[4]

The sequence thus established is summarized below, and is diagrammatically illustrated (figure 1) on page 189. I have sketched the 1815 car (no. iii in the series) as having a *straight body*, for it is obvious that the upward central curve of the modern wheel-car (together with the overslung axle) represents the effect on the design of the introduction of *large wheels*. The combined effect of these correctives is to keep the bumpers or runners as near the ground as they were with the small-wheeled type, and so to enable them to continue to perform their function as brakes.

Evolution of the Wheel-car

i. Sled, plate III. Still in use in Wales.
ii. Wheel-sled, plate IV. Still in use in Wales.

[3] 'Ground-car', in Monmouthshire. Information from Sir Joseph Bradney, F.S.A.

[4] Vol. I, p. 205. 'Its forepart slides along the ground, and under its middle is a pair of low wheels. It has a long body . . .'

iii. Wheel-car with 'low' (solid ?) 'wheels', 1815. Extinct in Wales. Sketch represents probable appearance.
iv. Wheel-car with large spoke wheels, plate I. Still in use in Wales.

The Gambo

A more normal type of farm cart, commonly used in Wales, the gambo or gamble, is illustrated in plates V and VI, one taken from the front, the other from the back. This specimen was seen at Tile House near Knighton, Radnorshire, during field work on Offa's Dyke, and was photographed by my friend Mr W. J. Hemp, F.S.A.

The reader will notice that the gambo shows features—the wheels, the long and narrow body with the heavy longitudinal beams of the frame, and rails and standards for holding the load in place—identical with the wheel-car. These parallels in form and structure suggest that the gambo has a similar origin. But there are obvious difficulties in this solution ; for the horse, in the gambo, is harnessed into shafts (rigid extensions of the frame) and there is no automatic braking on slopes.

Both Mr Hemp and I commented on the resemblance of the gambo to ox-carts met with on the northern shores of the Mediterranean. Walter Davies, in the *General View*, already quoted, describes the type in 1815, almost exactly as it is today ; but he says it then had either shafts for a horse or 'a beam for oxen in yokes'.[5] We may then regard the vehicle as of high antiquity, and as the British representative of a Continental ox-cart.

How then are we to account for the gambo's superficial resemblances to the wheel-car? I am inclined to consider these resemblances as the result of *convergence*—due to the two types being associated over a long period of time in the same environment.

The Truckle

The list of interesting cart types in Wales is not exhausted. A simple vehicle which may still survive in out of the way districts, and which at all events was in use within living memory in the Vale of Glamorgan and Pembrokeshire, is illustrated by watercolour drawings in the Royal Institution of Swansea and the National Museum of Wales. The latter drawing, plate VII, dated 1886, shows the main features of

[5] Vol. I, p. 207.

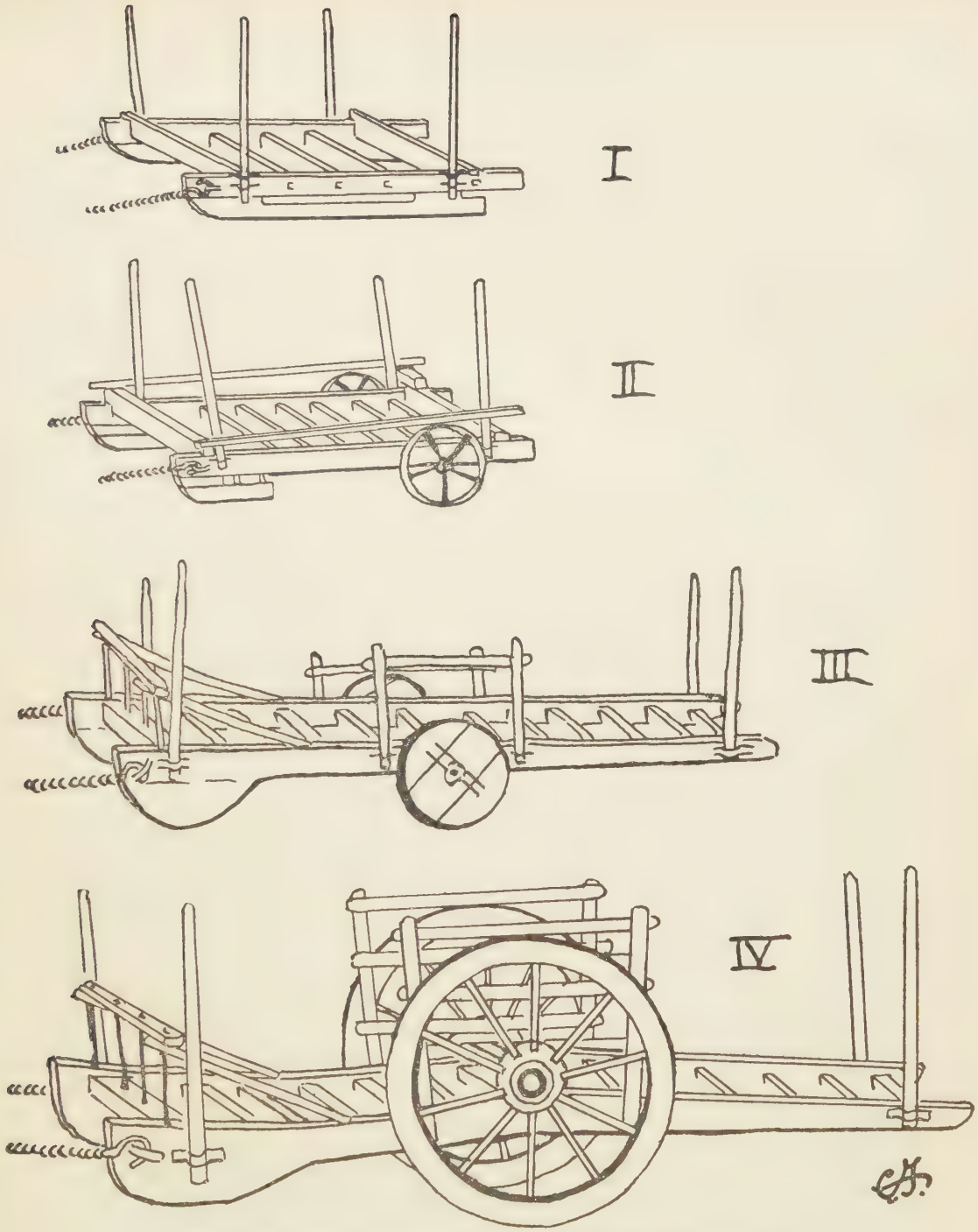


Fig. 1. DIAGRAMS ILLUSTRATING THE EVOLUTION OF THE WHEEL-CAR

this 'truckle' car or cart, the most striking of which are its small solid or 'block' wheels.[6] The type is perhaps more clearly exemplified by the photograph (plate VIII) of an Irish specimen. The truckle cart looks as though it might have been derived from a wheelless vehicle: not a sled like the wheel-car, but a shafted type, the free ends of which rested on the ground.

To anyone who is acquainted with the Irish or Welsh countrysides, the slide-car at once suggests itself as a probable ancestor of the Truckle and its related forms. This primitive and usually home-made vehicle consists of two poles or shafts joined by a series of cross bars at the broader end, on which a cage of basketry as in the Irish example illustrated (plate IX), or a framework of wooden staves reinforced with iron rods as in the Welsh example figured opposite, is placed to hold the load. The horse is harnessed between the shafts, and the heels of the structure rest on or drag along the ground. Though apparently clumsy it is efficient on steep slopes, and is freely in use today on Welsh farms, *e.g.*, around Builth Wells in Radnorshire, to bring down fodder, etc., from the mountains, and in the Glyncorrwg district of Glamorgan, where it is used for harvesting hay.

The 'truckle' car then, is only a slide-car with solid wheels added, and with a more substantial framework for the load.

It is just possible that the origins of the truckle may be carried still further back, and that it evolved from a sled—not one like those hitherto discussed, but a V-shaped structure. Mr Harold Peake tells me that in British Columbia, when the ranchers are working under heavy pressure at hay harvest, and the supply of carts or waggons is inadequate, he has seen two poles laid out in the form of a V roughly fastened together at the closed end, and hauled by ropes or traces (see fig. 3). The other ends are kept apart by the downward pressure of the load of hay. It is easy to see how the slide-car might have been evolved—through several intermediates—from such an improvised structure; that the 'heels' of the car are its widest part, is suggestive. All that is really necessary to effect the transformation is for the 'closed' ends to be separated sufficiently for a pony to get within them (when horse transport superseded man-haulage) and for the terminals to be fixed apart by a cross-bar.

We can thus present a possible evolutionary sequence for the

[6] Small block wheels, on an iron axle, are to be seen on a mid-19th century Welsh cart in the National Museum of Wales.

truckle as follows : the sequence is also shown diagrammatically in figure 3 on page 193.

Possible Evolution of the Truckle Cart

i. V-sled, figure 3 (1), as seen in British Columbia.
ii. Slide-car, figure 2, still in use in Wales.
iii. Truckle, plate VII, recently extinct in Wales.[7]

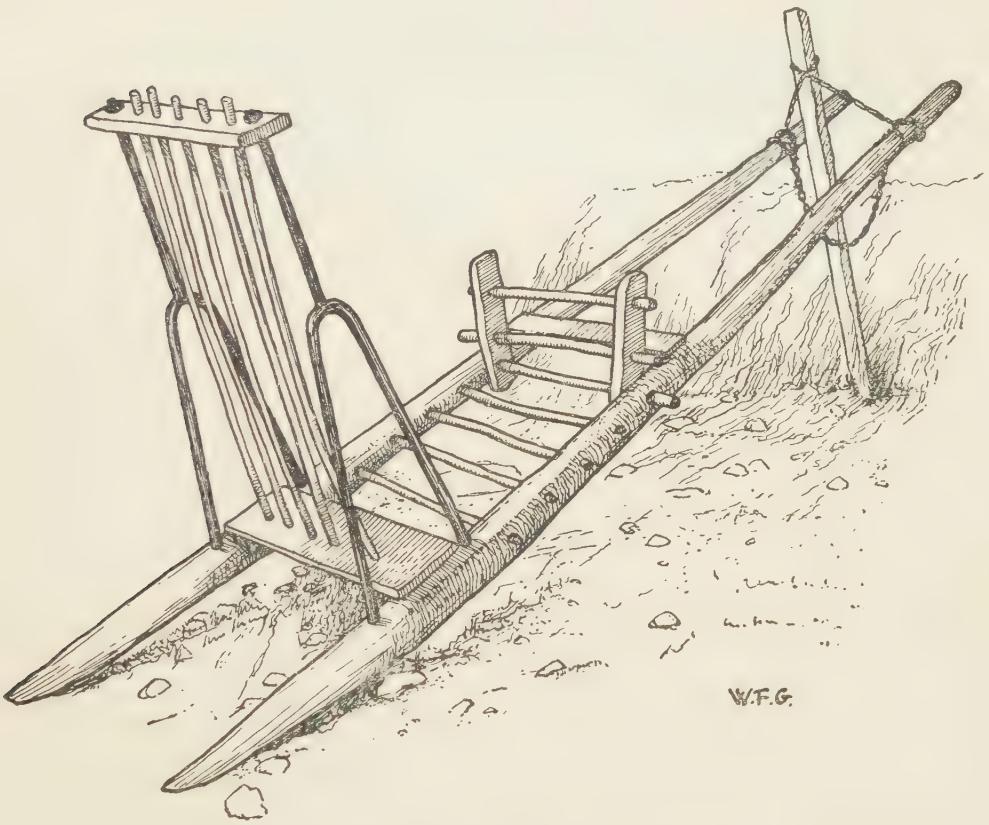


FIG. 2. SLIDE-CAR, WELSH TYPE, BRECKNOCKSHIRE
Sketch by W. F. Grimes, M.A.

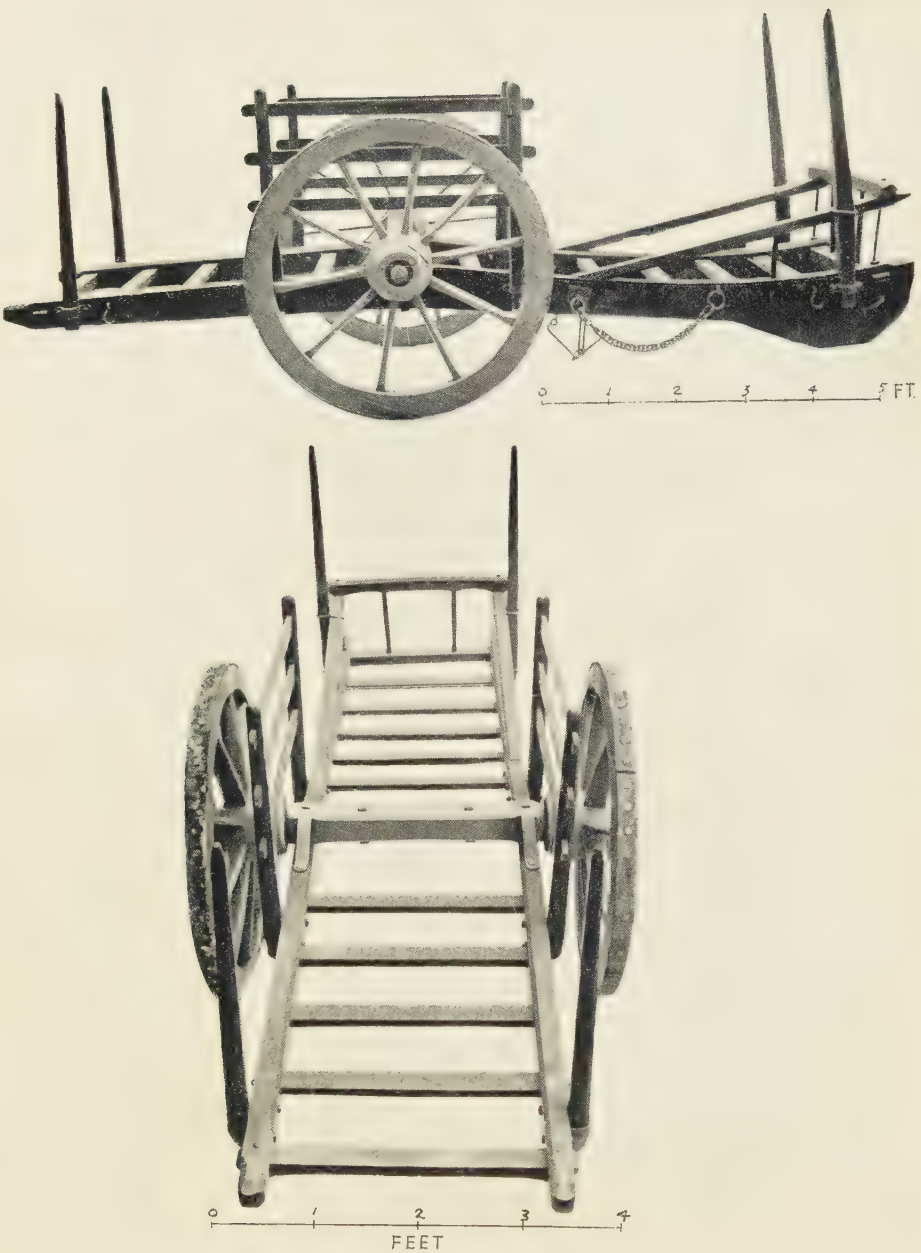
[7] It is not suggested that the evolutionary changes discussed in this paper (apart from the final specialization of the wheel-car) took place exclusively in Wales—or even in Britain. For example, Sigurd Grieg (*Oseberg Fundet* II, figs. 13, 14) figures solid-wheeled cars structurally identical with the 'Truckle', till recently in use in rural Sweden. It is, however, of the greatest interest to observe early forms existing side by side with developed types in the same country (Wales) and even county (Montgomeryshire).

Waggons

Means of horse transport much more highly developed than those hitherto described are, of course, found in all parts of Wales. In the coastal districts in particular, where corn was formerly grown, waggons or wains equal in design and workmanship to the best in the English counties were until the end of the 19th century constructed by Welshwrights.

It would be difficult to overpraise the feeling for form and proportion, and the skill, exhibited by the school of craftsmen in the Vale of Glamorgan which, in the 18th and 19th centuries, produced the Glamorgan bow-waggon, at one time the pride of the farmers of that county. The type became fixed in the second half of the 19th century (if not earlier), and was not thereafter changed, judging from the examples seen by the writer. The curved lines of these waggons seem loveliest when they are drawn, empty, across the dipping and rising ' lands ' of the cornfields ; they possess the seemingly-inevitable beauty and fitness of the last phases of the sailing ship, and of other specialized creations which have been perfected by generations of men content to work in one tradition. Such waggons in Glamorgan were almost heirlooms; they were only purchased by farming families at intervals of fifty years or so,[8] and the writer is informed that in the Cowbridge district when the wright had delivered to the farmer a new waggon, gay with blue and red paint, it was customary that its first journey should be with the family on Sunday to church or chapel. The example figured (plates x–xiii) was made by Richard Aubrey, one of a family of wrights working at Cowbridge, not later than 1885. One of his blacksmiths was William Baldwin. The waggon is said to have been made for a Morgan of Sker House near Porthcawl (the scene of Blackmore's novel, *The Maid of Sker*) and has been owned by Morgans for 45 years. The features which place the Glamorgan bow-waggon in the forefront of our noble series of insular waggon-types are the curved surboards (which give the type its name of 'bow-waggon'), the design of the panelled sides, the head- and tail-boards with their rows of

[8] Age of waggons: there are waggons still in use in Glamorgan over a hundred years old. One, made at Marychurch in 1825, is owned and used by the great-grandson of the maker, Morgan Williams; the writer was recently informed by a retired farmer, Mr Evans, of Llantwit Major, of a waggon sold by him in good condition in 1897, which was made in or about the year 1760. It had oaken axles (but more likely ash, I.C.P.), regarded by Mr Evans as very primitive indeed.



WHEEL-CAR, RADNORSHIRE, SEEN IN PROFILE (FRONT TO RIGHT), AND FROM THE BACK

Ph. National Museum of Wales

facing p. 192

SLED TYPE A IN USE AT NANTHIR, LLANBRYNMAIR, MONTGOMERYSHIRE

Photo: C. H. Evans

PLATE II

SLED (TYPE B) IN USE AT NANT-HIR, LLANBRYNMAIR, MONTGOMERYSHIRE
Ph. G. H. Peate

WHEEL-SLED, IN USE AT BRYNAERAU ISAF, LLANBRYNMAIR, MONTGOMERYSHIRE
Ph. G. H. Peate

PLATE V

GAMBO, AT TILE HOUSE FARM, NEAR KNIGHTON, RADNORSHIRE

Ph. W. J. Hoop[illegible]

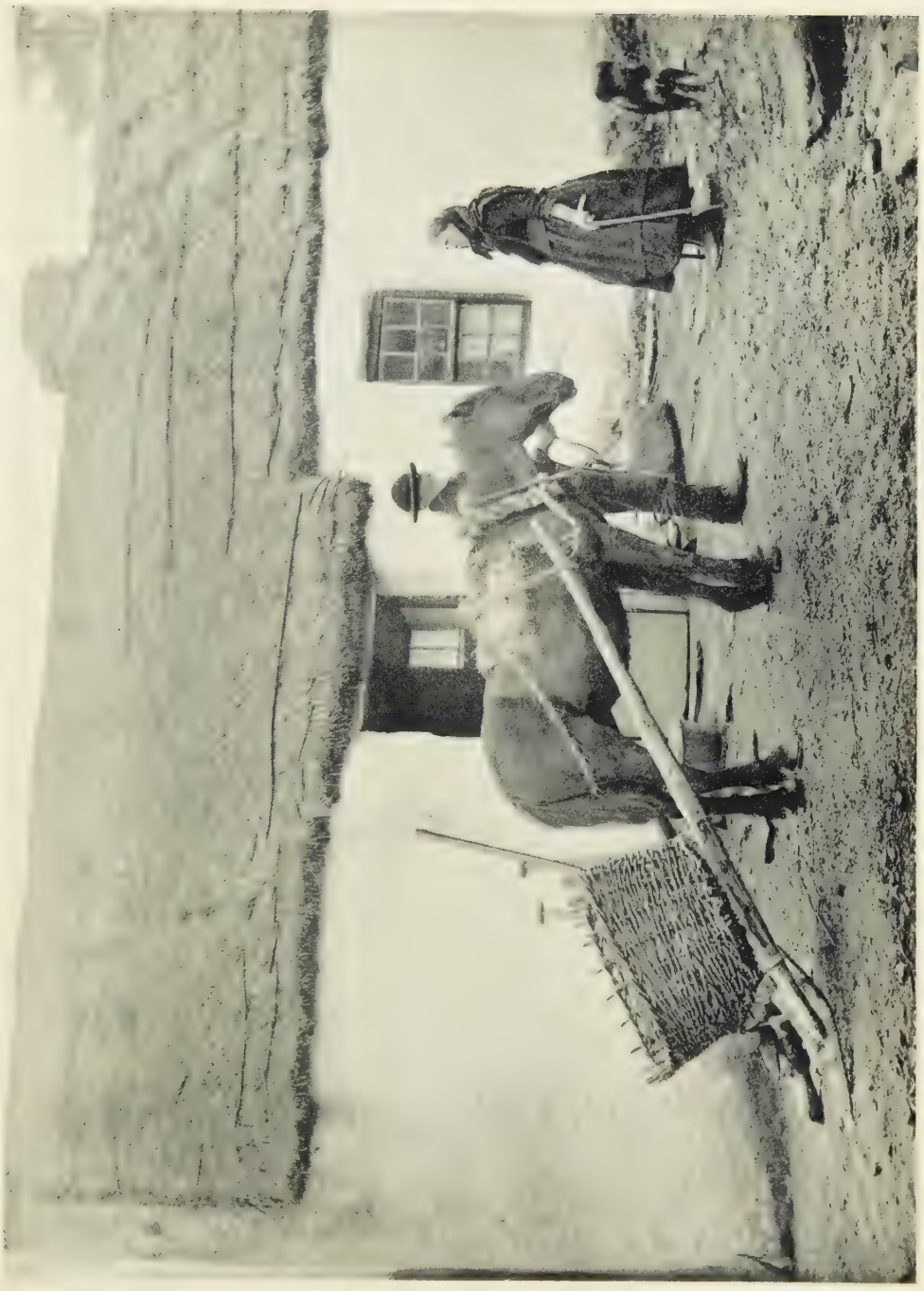
GAMBO, CONSTRUCTIONAL DETAILS
Ph. W. J. Hemp, F.S.A.

PLATE VII

TRUCKLE CART
Drawing dated 1886 in National Museum of Wales

IRISH WHEEL-CAR

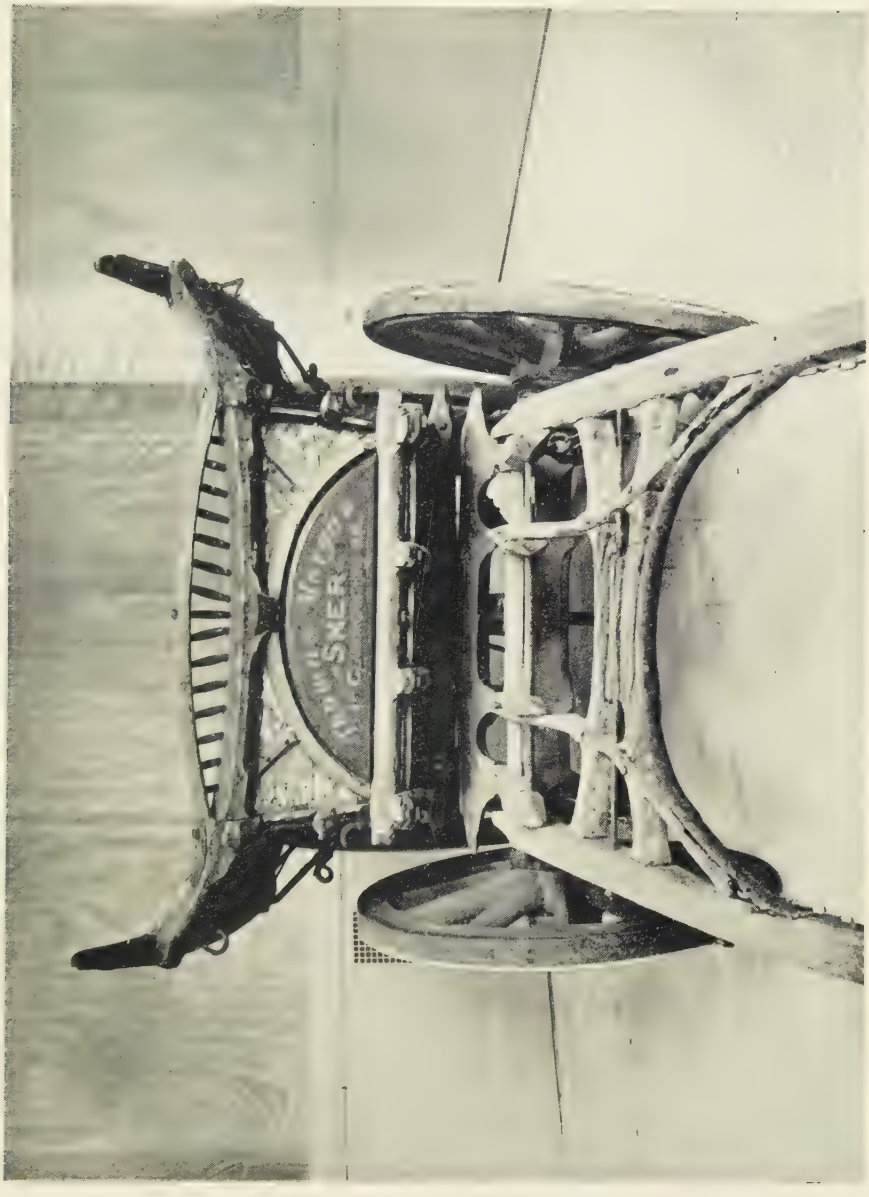
PLATE IX



SLIDE-CAR, ANTRIM, IRELAND

PLATE X

BOW WAGGON, GLAMORGAN, 1885 (THE WHEELS ARE NOT ORIGINAL)
Ph. National Museum of Wales



BOW WAGGON, GLAMORGAN: FRONT VIEW
Ph. National Museum of Wales

BOW WAGGON, GLAMORGAN : DETAILS
Ph. National Museum of Wales

BOW WAGGON, GLAMORGAN: DETAILS
Ph. National Museum of Wales

BOX WAGGON, VALE OF CLWYD, NORTH WALES

Ph. National Museum of Wales

BOX WAGGON, VALE OF CLWYD: DETAILS

Ph. National Museum of Wales

OX-CART, ORKNEY
Ph. Thomas Kent

balusters, the bracing of the shafts, and, last but by no means least, the ironwork. The blacksmith has everywhere accurately related the form and scantling of the iron to constructional needs, and, where opportunity offers, has created beautiful detail. Special attention is

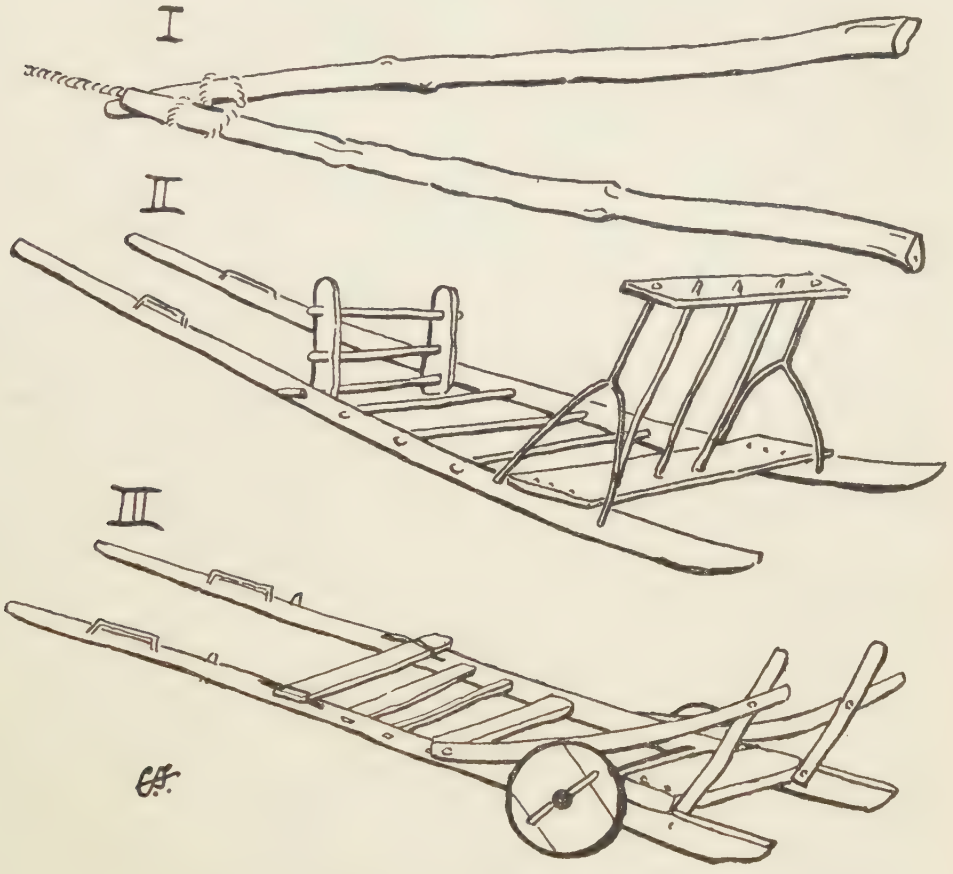


Fig. 3. DIAGRAMS ILLUSTRATING THE EVOLUTION OF THE TRUCKLE (III) FROM THE SLIDE CAR (II); AND THE POSSIBLE SOURCE (I) OF THESE TYPES

directed (plates XII and XIII) to the 'harms' (*sic*), front, centre, and back, which support the side frames and the surboards; William Baldwin described to the writer, with the proper pride of the craftsman, how the curved irons were welded on to the vertical shaft, and 'then cased

over to hide the weld'. The smith-craft of the country forges was clearly an 'art' as well as a 'mystery'.[9]

The use, for centuries, of oxen as draught animals in Britain renders it not improbable that the spiked ends of the surboards and the rising curve of the upper rail of the head-board between them (plate XI) are zoömorphic—reminiscent of the frontal of the horned ox; the balusters, then, represent the fringe of hair above his broad brow.

The waggon above described has been acquired by the National Museum of Wales for the Welsh Folk Collection ; and it is much to be desired that efforts should be made before it is too late to secure at least one example of every *regional type* of wain in England (and Wales), as being one of the highest expressions of our native craftsmanship, and that steps will be taken to determine the boundaries within which each type was or is in use. I doubt if county boundaries are as important in this connexion as our nomenclature—' Wiltshire waggon ', ' Sussex waggon '—would suggest.[10] Furthermore, the necessity of learning (before all the old craftsmen are dead) the names of the several parts and details of the structures in various counties (as has been done for Surrey) should be emphasized. No bow-waggons have been built in Glamorgan for thirty years and they never will be again ; the craft decayed with the decay of corn-growing. The country wrights, however, still appreciate the waggons, they know all the technical details and are glad to apply traditional and inherited knowledge of their construction to their repair, as was done in the case of the example under review.

With such information as is here envisaged we could construct a distribution map showing the range of the types, and see to what extent the zones thus defined are related to political, geographic or economic areas. The writer is conscious of the inadequacy of his information on these matters even for the districts with which he is especially concerned, and it is not improbable that others interested are in like case. Only by concerted action can the necessary data be obtained and the requisite material be preserved. Pending the founding of Field Museums, national or regional, where the waggons can be permanently lodged in

[9] It may be noted that the bed of the waggon is long-boarded. Sturt says that this better method had been replaced by cross-boarding in his shop (in Farnham, Surrey) before 1884, *The Wheelwright's Shop*, p. 67. The Glamorgan waggon unfortunately has lost the cratches or gornals for carrying hay.

[10] The essential features of the 'Glamorgan' waggons—though not, I think, so finely developed—occur in Gloucestershire and western Oxfordshire waggons.

their proper setting—the cart-shed of a reconstituted farm-steading—it may be suggested that the needed specimens of the type or types in any given county could be secured by the co-operation of three individuals : (1) a country auctioneer, who has early information when suitable examples are to be sold ; (2) someone with barns or stables willing to house the waggons until a Field Museum comes into existence ; and (3) a person who will provide the small sum needed for their acquisition. The writer has been told that, in Glamorgan, these old waggons, when they come under the hammer, sell for a mere song —£1 to £5, and it may be suspected that the same conditions apply almost everywhere in Britain. Some such procedure as is indicated above is essential if these vehicles are to be procured for museums at a reasonable figure. The waggon depicted in plates XIV and XV provides an illustration of the latter point. It is a fine example of the type in use in the Vale of Clwyd (North Wales) and is about fifty years old. A report, made for the National Museum, emphasizes its fine ironwork and original cratch. One of its original (dished) wheels, shod with a double row of strakes, is shown on plate XV ; part of its straight surboard can also be seen. The owner pointed out that it was worth at least £25 to him as he needed it for service ; though its present-day value in the open market was judged by him to be about £1. (The suggested scheme could of course be advantageously extended to include obsolescent vehicles of all types).

Any attempt to discuss in detail the evolution of our British four-wheel waggons would carry us far in space and time. The type, generally speaking, is the common inheritance of western European peoples. An important example is the waggon accredited to the Early Iron Age civilization of Denmark found in the Deibjerg bog, West Jutland, Denmark, and dating from early in the Christian era, which forms the frontispiece to volume 2 of Du Chaillu's *Viking Age*. This waggon has a platform for a cult-figure or idol, affixed to the side frames ; it has very finely wrought twelve-spoke wheels and the pole has a forked attachment like that of a modern ox-cart. Other Celtic waggons of similar date but less completely preserved are known.[11] There is important monumental evidence fixing the type of the Roman *carruca* of the early centuries of the Christian era ; particularly on the column of Marcus Aurelius (A.D. 161–80). This baggage waggon has

[11] See Sigurd Grieg in *Oseberg Fundet*, II, pp. 309–10.

a box-like body, as has a Teutonic waggon (shown by the platform to have been devoted to religious purposes) on the same monument.[12]

The well known waggon of the Viking period from the Oseberg ship-burial (*c.* A.D. 800) has spoked wheels, roughly wrought with deep fellies and but little removed from block-wheel types. The waggon has a rounded body of a form which survives to this day in Swedish peasant carts.[13]

The bodies of medieval waggons in France and Britain are of the box type seen in the earlier Roman and Teutonic vehicles. Many excellent representations of the French types of the 13th century are to be seen in an illuminated manuscript now in Mr Pierpont Morgan's library, reproduced by the Roxburghe Club.[14] The bodies of these French waggons are rectangular, with lattice or laths filling in the main frame of the sides ; they are drawn by horses or oxen, with traces and trace bars, or a pole. The wheels have eight spokes. A well known English example of the 14th century is that illustrated on ff. 181b–182a of the Louterell Psalter.[15] This is highly ornamented and has a hood, being designed as a travelling carriage for the transport of the ladies of a well-to-do family. Constructionally it is similar to the French waggons.

None of these medieval waggons show any trace of surboards for increasing the loading area, such as are seen on the Glamorgan waggon, and, in various forms, on most of our modern waggons and farm carts. It may be suggested that since they are all either military or pleasure vehicles we cannot institute comparisons. This is true ; but since a typical farm cart loaded with corn in the Louterell Psalter (f. 162a) has a simple rectangular rail-and-post body without trace of surboards, we may regard it as probable that this feature is a comparatively recent development. The simplicity of form, and similarity in type, of all the medieval French and English waggons referred to, leads me to suspect that highly specialized modern types of which the Glamorgan waggon is characteristic may be developments of the 16th–19th centuries, that is, they belong to the period in which individual farming

---

[12] Ibid, fig. 12.

[13] *Oseberg Fundet*, II, fig. 2 and pl. I : *Saga Book of the Viking Society*, vol. 10, fig. 21.

[14] *A Book of Old Testament Illustrations of the Middle of the XIII century* : described by S. C. Cockerell, 1927. I owe this reference to Mr H. S. Kingsford. See ff. 5b, 6b, 9a, 21b, 27b, 39a.

[15] Reproduced by E. G. Millar, *English Illuminated Manuscripts of the* XIV *and* XV *Centuries*.

was substituted for the medieval system, which was largely communal, and subject to a variety of controls, and customary limitations.

If this should prove to be the case, it is probable that *the release of initiative in farming stimulated experiments in the associated crafts, in particular among the waggon wrights; the result being the production of regional types of waggon in well-defined areas.*

Whatever the reason may be, the waggons bring out the innate artistry which our peasant stocks in Britain have manifested in all culture periods before the present. That this impulse towards beauty and efficiency in craftsmanship will in some form reassert itself may confidently be predicted.

APPENDIX

Solid-wheeled Carts

It will be recalled that general interest in the subject of solid-wheeled carts was awakened by Mr Woolley's discovery at Ur of a limestone plaque of 3000 B.C. showing a chariot with such a wheel, built up of segments; and by an illustration of a modern Sindi bullock cart with similar wheels, in an article written by Mr Mackay.[16]

This produced valuable notes and photographs, published in Antiquity,[17] on Sardinian and Spanish solid-wheeled carts by Mr W. J. Hemp, F.S.A., and Mr C. Suffern. A further batch of correspondence on the subject has been sent to me by the Editor of Antiquity; I am glad of the opportunity of appending to this article quotations from the letters. The occurrence and distribution of these primitive structures is of special interest to us, for it is probable that the rudiments of civilization rolled into Europe on solid wheels.

Captain D. R. Martin remarks that between Mysore and Ootacamund in Southern India there is 'a belt of country about 20 miles across in which the carts have solid wheels; the normal spoked wheel being found on either side of it'.

Major D. R. D. Fisher, R.A., writing from India, comments on Mr C. Suffern's suggestion that the reason there are no worn central tracks in the ancient Maltese cart-ruts is because the cars were man-hauled:—

'Apparently there is "no worn central track" between the cart-ruts in Malta or Sardinia. There wouldn't be. Look at the photographs [of Spanish and Sardinian carts]. The shape of the

[16] *Antiquaries Journal*, Jan. 1929, pp. 26–29.
[17] Antiquity, Sept. 1929, III, 340–342.

under-carriage keeps the bullocks well apart, with the result that each walks in his own wheel-track—or rather that each wheel follows its respective bullock's hoof-track ; result—two fairly broad ruts with the ground undisturbed between them.

' The bullock-carts used in this country are, as of course you must know, first cousins to those shown in your two photographs, except that the wheels are a shade less rudimentary. (I have a vague recollection of seeing solid wheeled ones in the Ganges kadir—I will now keep a look-out to see whether I can substantiate this). But a proportion of them are single-draught ones (naturally of slightly different construction) ; hence it is unusual to see a twin-rut track without at least a suspicion of a central rut.

' For these reasons, the hypothesis that the Maltese carts were man-drawn seems to me rather nebulous. Furthermore, tho' I have no notion of what the Maltese cart-ruts are like, I am inclined to think that any cart heavy enough to make a respectable rut would require sufficient man-power to make an equally respectable foot-path—tho' of course the two might coincide.

' P.S.—I have just been looking at half-a-dozen bullock carts—pair-draught. With these particular ones—and they are a very common type—the long narrow wedge-shaped body, made of grass-rope—comes half-way up the pole, keeping the bullocks wide apart, so that each wheel follows its bullock—indeed his tail almost touches it '.

Hitherto we have been in the Far East, but the next document in The Bag *Vehicularius*, as Carlyle would say, brings us near home. It is a photograph of a cart with four solid wheels from the Orkney Islands (plate XVI). Mr Thomas Kent, who sends it, remarks that 'this type of waggon and the team of Oxen is still used in the islands of Hoy and Graemesay, Orkney. The rear wheels are prevented from turning by the chain seen in the photograph, when going down a decline '.

The last document takes us to Canada, and Mr F. G. Roe, the writer, not only adorns a tale but points a moral. He quotes from Alexander Henry the younger, a well-known figure among the early fur-traders in the Hudson's Bay Territory :—

November 15, 1801 :—' Men now go again for [buffalo] meat with small carts, the wheels of which are each of one solid piece, sawed off the ends of trees whose diameter is three feet. These carriages we find much more convenient and advantageous than it is to load horses, the country being so smooth and level that we can use them in every direction'. (*The Henry-Thompson Journals ;* ed. Dr Elliott Coues, I, 191).

These must have worked successfully for a time at least, for in the *Journals* for 1803 we read as follows :—

March 30, 1803 :—' One of my men undertook to make a real pair of wheels on the plan of those in Canada : he finished them today, and they were very well done. I made him chief wheelwright, and we shall soon have some capital carts '. (Coues, 1, 210).

May 5, 1803 :—' I started Mr Cadotte with a man for Riviere aux Islets de Bois with one of our new carts. This invention is worth four horses to us, as it would require five horses to carry as much on their backs as one will drag in each of these large carts'. (Coues, 1, 211).

Mr Roe says that ' Henry was in charge of Upper Red River House, or Pembina House, close by where the Red River crosses the (now) International Boundary. It seems possible from this that we have here the beginning of the famous Red River carts ; which I imagine could have held their own with those of Spain for noise, Richard Ford himself being judge. If this be the case it furnishes an interesting example of men in different ages and lands seeking a similar solution in face of similar problems, of which primitive history presents many instances. In Henry's case, I have found no indication whatever in his *Journal* of any likelihood of him being a man sufficiently well-read to derive the idea from any classical source '.

Stone Vessels found in Crete and Babylonia

by G. A. Reisner

Director of the Harvard-Boston Egyptian Expedition

A SERIES of Egyptian objects found in foreign lands has been used to date archaeological groups in those lands, especially for periods the dating of which was unknown. In connexion with a study of Egyptian stone vessels I have taken occasion to examine the material reported from other lands, and it appears to me that some of the material used by scholars can be more accurately dated.

Conclusions have often been reached on the dating of single objects found in Egypt, and little attention has been paid to the range of the type in question. A stone vessel found abroad is co-ordinated with a single vessel found in Egypt, but the date of that single vessel is by no means the date of all vessels of that type. Take for example the vessels found at Knossos which Sir Arthur Evans calls bowls with broad flat rims, and I call spheroidal and quasi-spheroidal jars (Type III). They have two roll-handles. The type begins with a spheroidal jar with a round bottom in the middle predynastic period (my Type IIIa). In dynasty I it appears with a flat-base or a disc-base and persists in this finer form until dynasty IV (my Type IIIb), but in dynasty III, a degenerate form (my Type IIIc) appears which becomes predominate in dynasties IV-V, with a flat-base and unpierced handles. The degenerate examples have thick walls and are not so well finished. Now a few of the examples found in Crete are of Type IIIb which may be dated from dynasty I to dynasty IV. The rest are of the sub-type IIIc which may be dated from dynasty III to dynasty V. But not one of them has the round bottom of Type IIIa, and not one can possibly be dated to the predynastic period. Thus for my own use, I lay down :—

Principle no. I : In using Egyptian objects to date deposits in foreign lands, it is necessary to know the whole range of time during which the object occurs in Egypt, and the variations in form (sub-types) which the type assumes in the course of its range in time.

It is obvious that, in comparing Egyptian objects found abroad with the chronological series of forms (sub-types), the identification must be certain.

Principle no. 2 : An Egyptian object found abroad must be identical in form, material, and technique, with a type (or sub-type) of known range in Egypt.

This axiomatic principle has been generally recognized. The size may vary, but in general, as the identity arises out of manufacture by the same shops of craftsmen, the size of the foreign-found object will be within the range of sizes known in Egypt. The function of the vessel may however be quite different in the foreign environment from that in the country of origin. I mention for example the use of Rhodian wine-jars and modern petroleum tins.

There is one other point to be borne in mind. Many types of Egyptian objects, in particular vessels, pass through two stages of development—(1) an earlier stage during which the object is made for practical use, and (2) a later stage in which more or less degenerate examples of the type are made for burial purposes only.

It is necessary also to keep in mind the manner in which objects are distributed from one cultural area to another. Ancient trade was carried on both by caravan or water transport and by ' market-to-market' trading—'long haul' and 'short haul' trading. Both types existed from very primitive times. I consider it probable that, by means of ' market-to-market ' trading, valuable minerals, such as gold and lapis lazuli, were exchanged in small quantities between Babylonia and Egypt even in predynastic times. The ' long haul ' trading is of greater importance but is not necessarily to be assumed. It usually handles raw materials, partially manufactured goods (such as cloth for garments or metal in bars or ingots) and staples (such as food-stuffs, wines, oils). A part of these trade-goods is carried in containers of various sorts which are afterwards utilized in the country of destination, and form a notable factor in the exchange. ' Long haul ' trading between two different cultural areas always depends on the good will of political heads, from kings to tribal chiefs, and leads to an interchange of objects and material of a much more valuable character than the ordinary trade-goods. A full picture of the conditions under which the royal trading caravans of the New Kingdom worked between Babylonia and Egypt is given by the Tell Amarna letters, with their exchange of rich gifts. This picture fits in with what is known of the operations of the more recent trading caravans in primitive lands (such as central Africa). It is to be noted that part of the gifts mentioned in the Tell Amarna letters consists of stone and metal vessels as containers of perfumed oils, as well as weapons and ornaments, household

furniture and chariots of royal quality. Even under less developed political conditions, the caravan leader always finds it advisable to secure the friendship and support of tribal chiefs by similar, although much less magnificent, presents (cf. the experiences of the European explorers in Africa in the 18th and 19th centuries).

In Egypt, many classes of objects made for daily use even in predynastic times were made in manufacturing centres, usually localities especially favoured by the supply of materials and other local conditions, and they were distributed all over the country from these centres. The use of river transport permitted the despatch of bulky and fragile objects (such as pottery) without much loss, as at the present day. The Egyptian objects previous in date to the Old Kingdom which have been found in foreign lands consist almost entirely of stone vessels. These appear also to have been manufactured in special localities although we are unable to fix the number of manufacturing centres or their places. The history of stone vessels in Egypt may be briefly outlined as follows (see *Mycerinus*, page 130 ff) :—

(a) In the predynastic period, stone vessels are found in six basic types but are relatively few in number.

(b) In dynasty 0-dynasty I (early part), the basic types were modified ; some new types were introduced ; and the production was increased.

(c) The great expansion of the types and sub-types came in the reign of the third king, Zer, and in that time the corpus of stone vessels of dynasties I-II came into existence. In dynasty II these old types reached their maximum production, and examples are found in almost every grave (unless completely plundered).

(d) A further development of the traditional forms and a further expansion in the production took place in the reign of King Khasekhemuwy, last king of dynasty II. The corpus set up by that king reached its maximum production in dynasty III and persisted, although steadily declining, during dynasties IV-VI.

(e) In dynasty V, a new series of types were introduced alongside the remnants of the old corpus.

It is well known that periods of great production favour the export of the produced objects. That which is cheap at home may be exchanged for more valuable articles abroad. Thus the period during which we might expect an export, for trading purposes, of Egyptian stone vessels

is that from the time of Zer (third king of dynasty I) to the end of dynasty III. But the export as gifts, and in particular as royal gifts, of vessels of the old corpus might have taken place any time down to the end of dynasty V; or, in the case of a few bowl-forms, to the end of dynasty VI.

The stone vessels of the older corpus found in Crete were excavated by Sir Arthur Evans at the royal site of Knossos. Therefore they may be presents brought to the Cretan king from Egypt. The examples are as follows (the type designations are those in *Mycerinus*, pp. 130 ff):—

(a) Type IIIb: described in *Palace of Minos* (P. of M.) as bowl with broad flat rim and two pierced roll-handles; range of great production, dynasties I-III; total range, dynasties I-V.

Cretan examples:—

1. *P. of M.* II*, p. 30, fig. 12; porphyry, found in disturbed deposit northwest of Palace.
2. *P. of M.* II*, p. 30, porphyry; lower part with disc-base, found with no. 1 and probably also IIIb.

Possibly some of the fragments mentioned below are also of Type IIIb.

(b) Type IIIc: like IIIb with unpierced handles; range, Khasekhemuwy (last king of dynasty II) to end of dynasty III; total range extends to end of dynasty V.

Cretan examples:—

3. *P. of M.* I, p. 65, fig. 31; syenite, found under south Propylaeum.
4. *P. of M.* I, p. 65, fig. 32; porphyry, badly worn but probably my Type IIIc; found in disturbed debris north of palace site.

(c) Type IIIb or c: see above; fragments.

Cretan examples:—

5. *P. of M.* II*, pp. 31 and 59, fig. 28; porphyry; disc-base; tube bored; lower part only; found in same deposit as nos. 1 and 2.
6. *P. of M.* II*, p. 30; 'a piece of another vessel of brilliantly polished black porphyry'; found in the same deposit as nos. 1, 2 and 5.
7. *P. of M.* II*, p. 16-17; porphyry; fragment, found in debris in Neolithic House A.

Thus there are reported seven vessels of Type III of which one is complete, one nearly complete, and the rest represented by fragments. As far as can be judged without seeing the material, none of these is of the finer workmanship of dynasties I-II. Certainly none of them is of the predynastic Type IIIa, which has a rounded bottom. In my opinion the most reasonable date for the group is dynasty III but the examples of Type IIIb might be a little earlier and those of IIIc, a little later.

The other Egyptian types of stone vessels found in Crete are represented by one example each. The fragments from which the type is reconstructed are relatively small and the exact identification is by no means certain.

(d) Type I : cylindrical jar, ' bored with a tubular drill ' ; ranges in four sub-types from dynasty I to dynasty VI.

Cretan example:—

8. *P. of M.* II*, p. 16, fig. 6 ; mottled limestone ; base only which admits of several other reconstructions than that given ; found in debris in Neolithic House A, and probably of the same date as Type III, no. 7, above. Very small form.

This fragment of a cylindrical jar, while it is certainly Egyptian, cannot be of the predynastic period. The small forms are known from dynasties I to VI, and are very common at Giza during dynasties IV-VI, but it would be rash to attempt to date it to any one of the first six dynasties.

(e) Type Xb (3) : slender conical cup ; range from Khasekhemuwy to dynasty V ; the variation with folded rim spout is known from only one example in Egypt, see QUIBELL, *El-Kab*, pl. X, no. 20 (provenance not given but possibly from grave 101 of dynasty IV).

Cretan example:—

9. *P. of M.* II*, p. 57, fig. 27 ; diorite ; fragment ; found in disturbed debris west of palace.

This type of folded spout is well known in Egyptian vessels of dynasties IV-VI and indeed in diorite bowls. Sir Arthur Evans' fragment may perhaps be reconstructed as a bowl instead of a beaker. The evidence is not sufficient to fix the date exactly in either case. The range of the folded rim is probably dynasties III-VI.

(f) Type XIb (4) or (5) or (6) ; bowl with recurved rim, or carinated bowl ; the main type begins in dynasty I with grooved rim, often with

cord in relief and flat bottom, XIb (1). In the reign of Khasekhemuwy and dynasty III, the form appears with an upright rim and in two variations, one with flat bottom, XIb (2), and one with rounded bottom XIb (3); sub-type XIb (2) is found as late as dynasty V (end). In dynasty IV (Sneferuw), the form with flaring recurved rim appears and also occurs in two forms, one with flat bottom, XIb (4), and one with round bottom, XIb (5); these two sub-types occur in dynasties IV and V and perhaps later; another sub-type with exaggerated flare to the rim occurs in dynasty VI.

Cretan examples:—

10 and 11. *P. of M.* I, p. 86, fig. 55; diorite; fragments of two bowls 'on palace site'. The form may be either XIb (4) or XIb (5). The range is dynasties IV-V but without excluding dynasty VI.

Fragments of another example of sub-type XIb (4) or (5) were also found on the palace site with pottery of the Middle Minoan I period. This is of liparite, a material imported from the Aeolian Islands and used by Cretan craftsmen. This may be a copy of the Egyptian type, a fact which indicates perhaps the preservation of Egyptian vessels of this type for a long time in Crete, as Sir Arthur Evans points out.

The eleven vessels of four types, most of them represented by fragments, are all that I can find in the *Palace of Minos* which can be identified with Egyptian types or sub-types. It is quite clear that none of these vessels is of the predynastic period. All except the last in the list, the carinated bowl, are containers of oils or perfumed ointments and came to Crete without doubt as presents to the Cretan king, not as trade-goods. The carinated bowls which were table dishes of a ceremonial character must also have been brought or sent as presents. It may be assumed that these fragments represented the import of a larger number of vessels than those actually found, but no safe conclusion can be drawn as to the original numbers. Nine of the examples are identified with deposits of debris which are older than the great royal palace. Two vessels, nos. 7 and 8 are, if I understand rightly, connected with the Cretan neolithic period by Sir Arthur Evans. One other, no. 3, is stated to have been found under the south Propylaeum in a stratum between the neolithic and the sub-neolithic. This jar is of the type form IIIc and the most reasonable date is dynasty III but it might be of dynasty IV or V. I would assign the vessels nos. 1-9 to about this same period, dynasty III (with the possibility of dynasties

IV-V). Nos. 10-11, the carinated bowls, are, as Sir Arthur Evans states, of the period dynasties IV-VI, as far as the date of manufacture is concerned, but may have been preserved in Crete for some time after their importation (as recognized by him).

The only other objects reported in *P. of M.* which I can identify as possibly Egyptian are three fragments of mace-heads (*P. of M.* II*, p. 11, fig. 3, k (d) and l (d) ; p. 17, fig. 7 (b): k (d) of white marble is reconstructed from the base as a rude pear-shaped mace-head ; no. l (d) of variegated stone as a bulbous mace-head ; and the other of porphyry is unrecognizable from the figure. Mace-heads of these forms were in use in Egypt as late as the Middle Kingdom. The Cretan fragments were found in the neolithic deposit beneath the original pavement of the palace (l.c., p. 7-8) in stratum B (p. 15). The third fragment was in Neolithic House A and is apparently of the same date as the jar no. 7 of Type IIIb or c. It is quite impossible from the forms and materials to say that these fragments were of the Egyptian predynastic period. They might just as well be of the Old Kingdom, and I would suggest that they are probably of the same date as the stone vessels, that is dynasty III (or perhaps IV-V).

My conclusion is that there is no Egyptian object reported in the *Palace of Minos* which can be dated with safety to the predynastic period or even dynasties I-II.

In addition to this direct material, Sir Arthur Evans has pointed out a number of suggestive similarities with Egyptian objects previous in date to the end of dynasty VI. All this evidence is secondary to the direct material. I may say that I am sceptical of any connexion between the small Cretan figures and the ivory figures of the predynastic period (cf. *P. of M.* I, fig. 52 ; II*, fig. 13). For my own use I lay down :—

Principle no. 3 : Primitive peoples in the same state of culture having similar needs and similar materials are apt to produce objects and decorations of a similar appearance.

Mere similarities between objects of two cultural areas which are not equivalent to identity of form, material and technique, are not sufficient proof of the interchange of objects between the two areas. But if the import of a definite class of objects into a field can be proved, then imitations of that class found in the field in question become significant (as in the case of carinated bowls in Crete). As a corollary, similar objects from different cultural areas do not necessarily have a common origin. In each country a similar object may have been developed

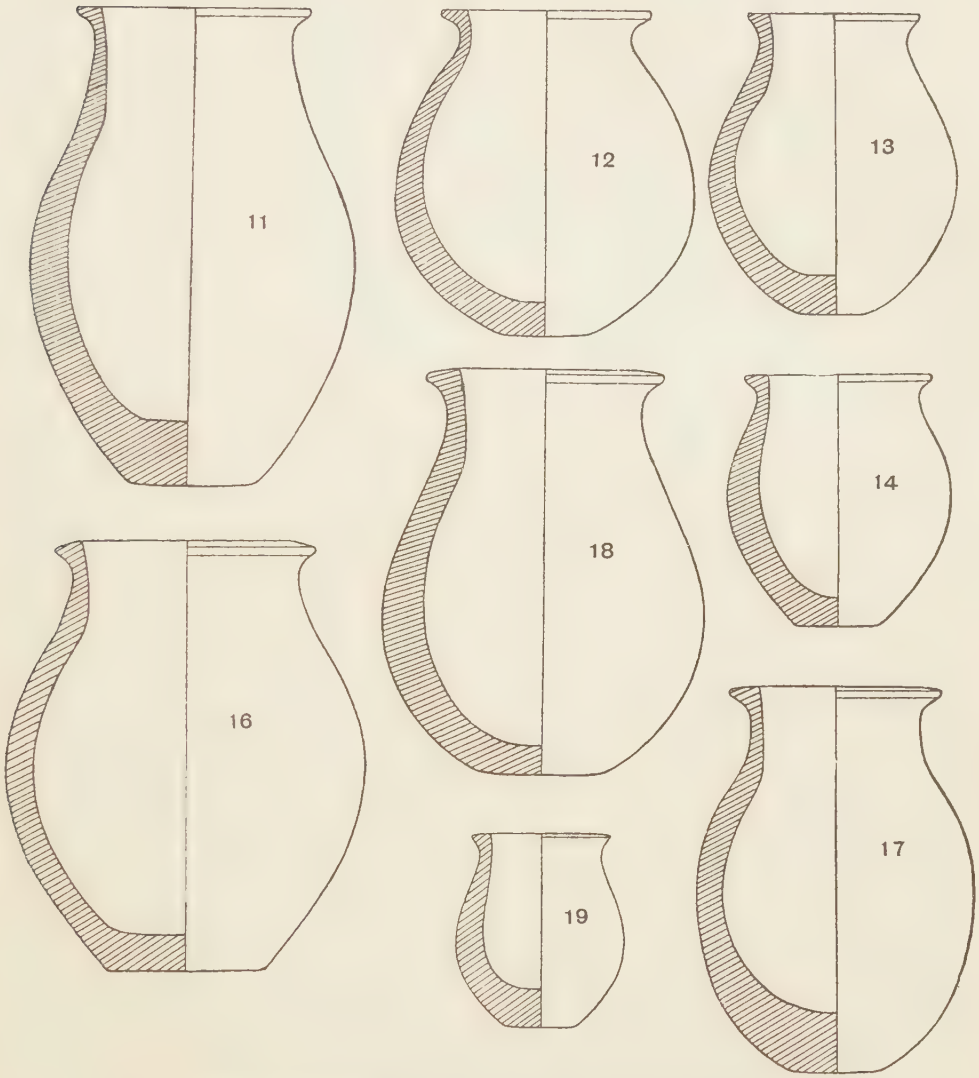


FIG. 1. SUMERIAN STONE JARS, NOS. 11–14, 16–19 : ALL UN-EGYPTIAN FORMS
By permission of the Trustees of the British Museum

independently on the same natural basis (function, material and technique). In view of these considerations, I feel doubtful of the force of the evidence seen by Sir Arthur Evans in the round-topped table (*P. of M.* I, p. 75, fig. 43-45); the double spout (l.c., p. 80, fig. 48-50); and in the seals (l.c., pp. 117-126). The Egyptian flat-topped table was introduced by Khasekhemuwy and continued to the end of dynasty VI, while the Egyptian button seals began in dynasty V.

Sir Arthur Evans' chronological arrangement of his periods is a very fine piece of work. His correlation of the Early Minoan III, Middle and Late Minoan with the Egyptian periods is correct in all essentials. The evidence of the Egyptian material cited above seems to prove that some modification is required for the correlation of the Cretan Neolithic and Early Minoan I and II. Sir Arthur Evans relied on the Egyptologists for the dating of the Egyptian material, but the history of Egyptian stone vessels has progressed considerably since the original study was made of the Cretan material (cf. Sir Flinders Petrie's outline in *Diospolis Parva* with that in his *Prehistoric Egypt*). In *Mycerinus* (appearing about February 1931) I have carried Sir Flinders' series down to dynasty V, and in *Naga-'d-Dêr* III (in the press) to the end of dynasty VI (see also BRUNTON, *Qau and Badari*).

The material for Babylonia recorded by Mr C. L. Woolley is not yet so completely published as that from Knossos, nor have I been able to obtain a complete set of the published reports. I have the first volume of the final report, *Al'Ubaid*, the *Antiquaries Journal*, vol. VIII, no. I (kindly lent by Mrs Percy Stout), Mr Woolley's *Sumerians* and *Ur of the Chaldees*, and a series of drawings of 25 stone vessels in the British Museum supplied by Mr O. G. S. Crawford. In *Al 'Ubaid*, pls. LXI and LXII give drawings of 41 forms (numbered I-XLI, see also fig. 7-9). In the *Antiquaries Journal*, VIII, pls. IV and V, photographs are shown of eight stone vessels. As a basis I take the 25 forms offered by drawings of vessels in the British Museum and numbered 1-25. Most of these forms are among those in *Al 'Ubaid*. The vessels fall into two groups, (1) fourteen vessels which are manifestly not of any Egyptian types known previous to the end of dynasty VI, and (2) eleven which have a similarity to Egyptian forms.

Eight of the un-Egyptian vessels are jars, nos. 11-14, 16-19. These have two types of rim—a flat-topped rim of varying width, undercut in a curve (nos. 11-15, 23) and a rim with two sloping surfaces (' sloping rim ') with a flat edge (nos. 16-22). Neither of these rims is

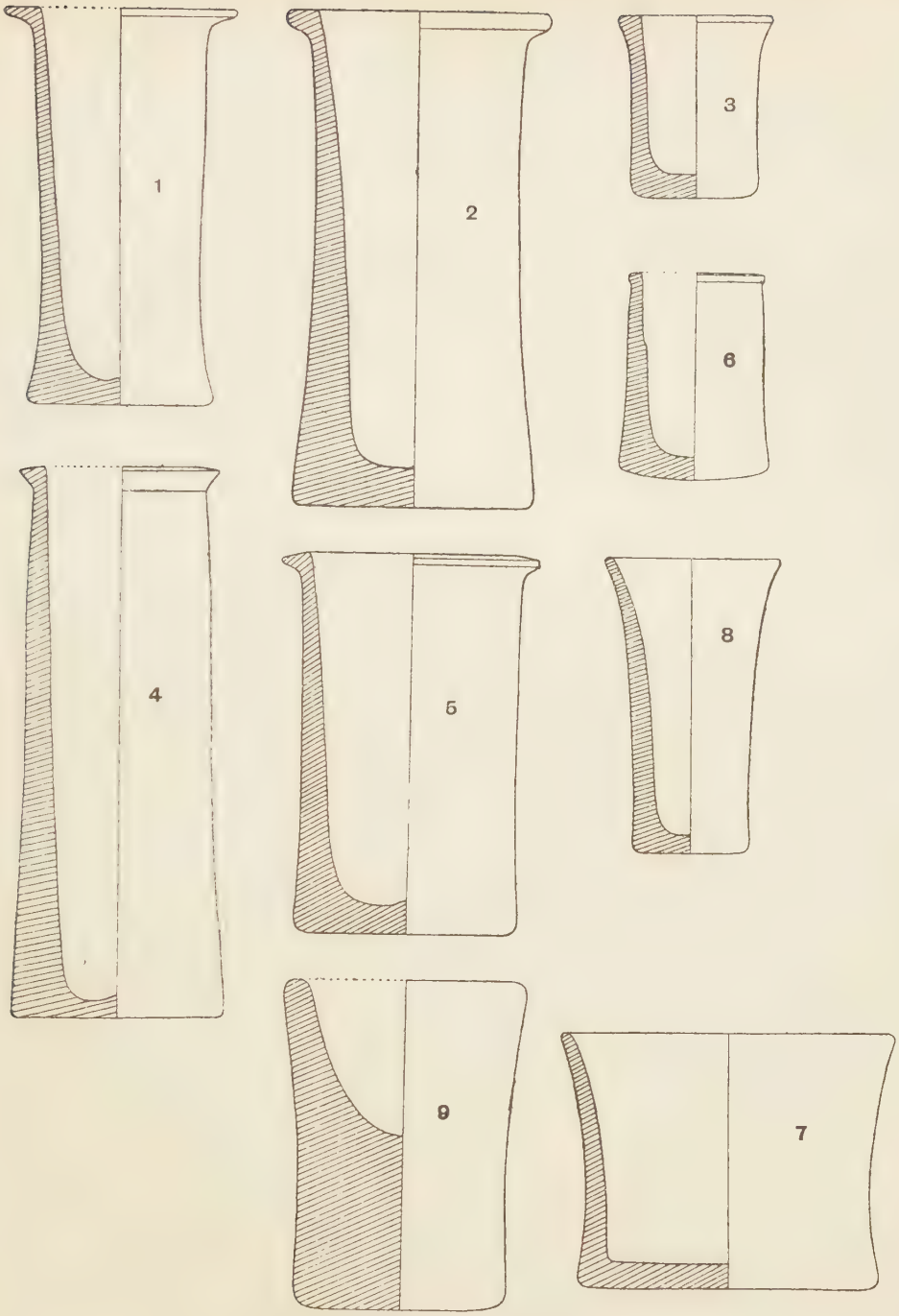


FIG. 2. SUMERIAN CYLINDRICAL JARS OF STONE, NOS. 1–9
By permission of the Trustees of the British Museum

of characteristic Egyptian form such as is found in well-made vessels, but possibly isolated examples might be found in rude degenerate vessels from provincial graves. But both these rims occur in the Sumerian pottery (*Al 'Ubaid*, pls. LV-LX). The flat-topped rim is shown in pottery Types XXXIX, LVI, LXXII-LXXIV ; the sloping rim in pottery Types XLI, and XLII, although a sloping topped rim with flat underside is more common (Types XXXV, XXXVI). The un-Egyptian stone vessels were certainly made in workshops situated outside Egypt and, in view of the rims, this workshop was probably in Sumer itself. The Sumerians in the time of these vessels had mastered the technique of stone objects as is shown by the statues, reliefs, etc., and were certainly able to cut stone vessels. They probably brought their better kinds of stone from a distance just as the Egyptians did, and to a certain extent, the Cretans.

The most striking of the vessels with a similarity to Egyptian forms are the cylindrical jars (my Type I). The type occurs in rather rude forms in the predynastic period but is one of the commonest types of the period of expansion of the industry in dynasties I-IV, when it occurs in four sub-types with many variations. The Sumerian examples present the same two rims as the un-Egyptian vessels, and also a plain rim. A plain rim does occur in Egypt in isolated examples of all periods of the early dynastic corpus, but it is usually flat on top (not rounded) and the examples I have seen have been jars of Type Ic (without cord in relief) which have been broken about the mouth and worked down. The Sumerian examples have heavy rounded edges. I consider that the rims prove that the Sumerian cylindrical jars are from the same shops as the un-Egyptian Sumerian vessels. The Egyptian jars of this form were containers of perfumed oils or ointments for which stone is much better fitted than pottery. The Egyptian type originated, I think, in receptacles which were naturally of a cylindrical form—sections of wooden log, ivory tusk, or horn. The same materials were at the disposal of the Sumerians and I can see no reason for doubting an independent development of this form in Sumer.

A number of other Sumerian vessels show a suggestion of Egyptian forms—the shoulder jar, no. 10 ; the pans and open bowls (nos. 24, 25, and *Al 'Ubaid*, stone Types VII-XIX, XXI-XXV, XXVIII-XXX, XXXII). But none of these are duplicates of Egyptian types of well-made stone vessels. The general form of the shoulder jar occurs also in pottery with the characteristic Sumerian rims (see *Al 'Ubaid*, pottery Types

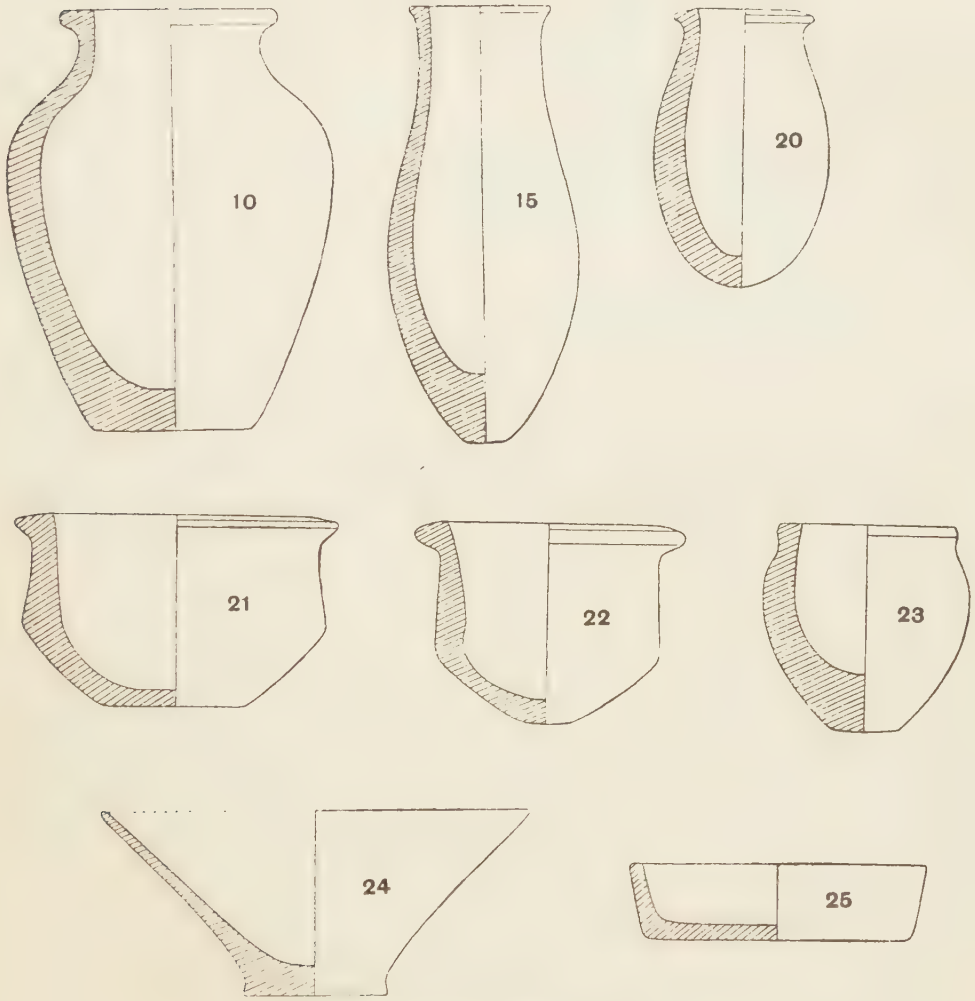


FIG. 3. SUMERIAN STONE VESSELS, NOS. 10, 15, 20–25
By permission of the Trustees of the British Museum

XXII, XLI, LVIII, and LXXIII). The bowl forms, some of which also occur in pottery, are of such a simple character that they may be found in most cultural fields. The edges, and the heavy walls give them to my eye a distinctly un-Egyptian appearance. Once we admit that the Sumerians had access to a source of supply outside Egypt (probably in Sumer itself), it becomes probable that all the vessels are from the same un-Egyptian source.

Identity of form between the Sumerian stone vessels and the Egyptian stone vessels is clearly lacking. As to the materials, I am in a greater difficulty. Many of them are marked alabaster or calcite, but I find no statement from Mr Woolley that these are the Egyptian varieties of those stones. Mr Lucas, who has seen the examples in the British Museum (through the glass) tells me that he judged them to be of un-Egyptian materials.

The technique has some similarity to the most usual form of Egyptian technique—the boring with a stone. Examples of tube-bored vessels do not seem to occur. As for the stone borer, it may or may not have been a weighted crank-borer like that of the Egyptians.

The conclusion reached from the materials at my disposal is that none of the vessels reported from Ur is of Egyptian origin. They serve no useful purpose in the correlation of the early Sumerian and Egyptian periods.

NOTE

Thanks are due to the Director of the British Museum, to the late Dr H. R. Hall and to Mr C. L. Woolley for facilitating and allowing the publication of the drawings (figs. 1–25) which were specially made for this article; and to the Keeper of the Ashmolean for similar facilities. It has not been possible to publish the latter, but thanks are due both to the Keeper and to Sir Arthur Evans for his help in the matter.—EDITOR.

Noah's Flood*

by Margaret F. Malim

DURING the last two years the newspapers have more than once announced with a flourish of headlines that undoubted evidences of the Great Flood had been discovered in Mesopotamia.

The average reader felt quite excited. Noah's Ark had been his earliest Sunday toy, and he had always felt vaguely aggrieved in later years on being told that nowadays learned people considered the Story of the Flood to be merely a myth. Consequently a good many readers eagerly read the articles, which held out a promise of restoring a cherished tale of childhood, only to find themselves involved in technical details of excavations in buried cities belonging to remote civilizations with unpronounceable names of which they had never heard.

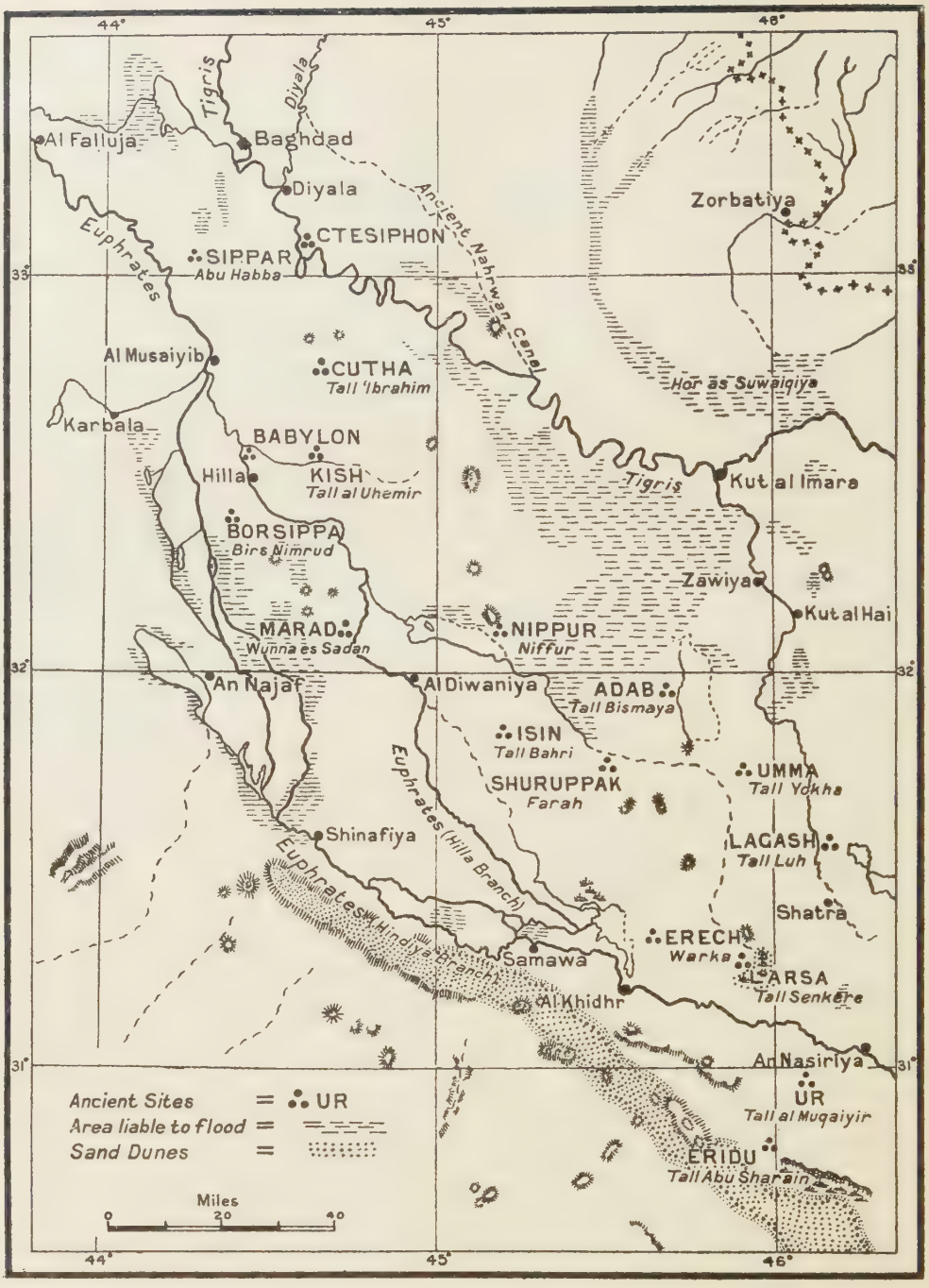
It was all too impossibly difficult. The plain man failed to understand what broken pottery had to do with the matter, and it made his head whirl to think that the documents of those early days were written on clay tablets, often badly chipped, in crude characters or even earlier pictorial script, such as the children produce in the kindergarten. Evidently it was only a matter for the experts he concluded ruefully, and gave it up.

But many puzzled people are still asking questions about the recent discoveries, and in order to satisfy their natural curiosity the following simple summary has been put together. It is an attempt to lay before the general reader an account of the manner in which the Story of the Flood has come down to us, only touching on technical details when it is absolutely necessary.

We will begin with the familiar story of Noah in the book of Genesis. Every one can find it for himself in the Bible, and note that

---

* The dates given in this article must be regarded as approximate only. There are still no fixed and universally accepted dates in years before about 2000 B.C. in any part of the ancient world.—Editor.


44°
45°
46°
33°
32°
31°
Tigris
Diyala
Al Falluja
Baghdad
Diyala
Ancient Nahrwan Canal
Zorbatiya
Euphrates
CTESIPHON
SIPPAR
Abu Habba
Al Musaiyib
CUTHA
Tall 'Ibrahim
Hor as Suwaigiya
Karbala
BABYLON
Hilla
KISH
Tall al Uhemir
Tigris
Kut al Imara
BORSIPPA
Birs Nimrud
Zawiya
Kut al Hai
MARAD
Wunna es Sadan
NIPPUR
Niffur
An Najaf
Al Diwaniya
ADAB
Tall Bismaya
ISIN
Tall Bahri
UMMA
Tall Yokha
SHURUPPAK
Farah
Euphrates (Hilla Branch)
Shinafiya
LAGASH
Tall Luh
Euphrates (Hindiya Branch)
Shatra
ERECH
Warka
Samawa
LARSA
Tall Senkere
Al Khidhr
An Nasiriya
UR
Tall al Muqaiyir
ERIDU
Tall Abu Sharain
Ancient Sites = UR
Area liable to flood =
Sand Dunes =
Miles
0
20
40

Noah was the tenth descendant from Adam ; that he sent out a raven and a dove ; that he offered up a sacrifice on leaving the ark ; that as a reward for his piety the Lord promised that mankind should no more be destroyed by flood.

The Old Testament scriptures were inherited by the Christian Church. Early Christian writers made a study of the writings of Jewish commentators, and were aware that the Babylonians had a story of the Flood closely resembling the story of Noah, but it was always assumed that it had been handed on by the Hebrews, who were carried away into captivity at Babylon. Take, for example, Eusebius, who wrote in A.D. 325. He quotes largely from a history of Babylon written by a Babylonian priest called Berosus in 300 B.C.

Berosus tells a story of Xisuthros, the tenth king of Babylon, (compare Noah, the tenth from Adam) who was warned by the god Cronos of the coming of a flood. He was told to build a ship for his family and friends, and also to include representative beasts and birds; to supply it with food, and also to write a history of the world and bury it at Sippar. When the flood was abating he sent out birds, which first returned with clay on their feet, and finally came back no more. The ship grounded on a mountain and Xisuthros offered a sacrifice, after which he disappeared, caught up by the gods for his piety. His family were told by a voice to go and unearth the buried history and preserve it.

On comparing this version with the story of Noah, we shall notice that it differs in important details, but the Early Fathers assumed that the Babylonians had evolved a garbled version of the story told them by their Hebrew captives.

So the matter rested, until in 1845 an English explorer, Sir Henry Layard, dug in the ruins of Nineveh, the ancient capital of the Assyrians, and came upon the remains of the library in the palace of Assur-bani-pal. The palace had been burnt and the floor of the library had collapsed, throwing together the thousands of clay tablets with their invaluable inscriptions. Some twenty thousand of the least broken tablets were brought to England, and deciphered. The majority were in the Assyrian language, written in the cuneiform script. Others were in earlier dialects ; some were in picture writing which it was impossible to make out, until further tablets, discovered later, were found to be dictionaries and grammars of these earlier dialects.

Imagine the patience of modern scholars, who have learnt to use dictionaries, not printed on convenient thin paper but incised on clay

tablets more or less chipped and imperfect. Then let us link up these students with the hard-working scribes of the time of Assur-bani-pal, king of Nineveh, who reigned from 668 to 626 B.C. They must have spent hours in the palace library, compiling dictionaries and grammars of the older dialects of Mesopotamia. They gradually made out the language of the Sumerian people, dating from before 2000 B.C., and wrestled with tablets in the Accadian or Hittite dialects. Considering that the archaic tablets had all been copied by hand and re-copied, it is hardly surprising that a good many errors have crept in, especially with regard to numbers, such as the lengths of the reigns of various dynasties.

Among these Assyrian workers of the seventh century B.C. was a scribe named Sin-liqi-unnini, who compiled a complete version of a long epic poem concerning the wanderings and adventures of a mythical hero, called Gilgamesh. In this we learn that Gilgamesh met in the course of his wanderings an ancestor, called Uta-Napishtim, who had escaped from the Great Flood, and received the gift of eternal life for his piety. He had lived at Shuruppuk, on the banks of the Euphrates, and had been warned by the god Ea to build a ship and to enter with his family and cattle. Some of the details agree more closely with the story of Noah than those in the tale of Xisuthros, for Uta-Napishtim sends out a raven and a dove and, after offering a sacrifice, he receives the divine promise that mankind shall not again be destroyed by flood.

It was the discovery of a fragment of a tablet giving this episode from the story of Gilgamesh, that raised such interest among Biblical students when it was made known to the public in 1872, for it was evident that this version of the Flood story, the details of which so closely resembled the story of Noah, had been written down by the Assyrian scribe in the seventh century B.C., that is to say, before the time of the captivity of the Hebrews in Babylon. Scholars were confronted by the problem of how the Hebrews and the Assyrian scribe could have obtained the story from independent sources.

A more recent study of the tablets from the library of Nineveh, and of others found elsewhere, has revealed various versions of the story, including three tablets in the Accadian dialect, dating from about 2000 B.C., and a fragment in the Sumerian language several centuries older.

It is generally considered that the Hebrews passed on by word of mouth from generation to generation a store of legends, accumulated

by their ancestors in the days before Terah and his son Abram left Ur of the Chaldees, and wandered West, first to Haran and afterwards towards Palestine. Among these legends was the Story of the Great Flood.

At this point it is as well to state clearly the difference between a myth and a legend. A myth is a tale invented by primitive people to express the observed facts of nature. For instance, the early races had a series of sun myths to express the cycle of the seasons. A legend, on the other hand, is a tale embodying the race-memory of an event that actually occurred in the far past. It may be overlaid with all sorts of apocryphal details, but at the core lies a definite, concrete event.

For half a century, the question has been debated as to whether the Story of the Flood was a myth or a legend ; that is to say, whether it ever took place, and if it did, whether it covered the whole earth, or only that portion of it known as ' the world ' to the dwellers in Mesopotamia.

The evidence of the world-wide stories of a Flood, from Asia, America and the Malay archipelago has been sifted. Europe has practically none. The stories from India and China as well as from America might well be the product of the race-memory of local floods comparable to the recent disasters caused by the Indus and the Mississippi. Those from the Malay archipelago may tell of tidal waves. In the absence of any geological evidence for an universal flood submerging the whole earth, it is thought that the Great Flood was confined to Mesopotamia.

In 1929 epoch-making discoveries were made by two parties of archaeologists working respectively at Ur and Kish in the Euphrates valley. Deep down under the remains of three or four cities, superimposed one upon another, were found layers of clean, silted clay obviously deposited by a considerable flood. This brings us to the difficult but interesting part of the subject—the evidence of archaeological discoveries. First we have to consider a further series of clay tablets ; afterwards the significance of broken pottery.

Mention has already been made of the fragment of a tablet in the Sumerian language, referring to the Flood, and dating from before 2000 B.C. It was discovered at Nippur, a sacred city of the Sumerians. Near by were found other broken tablets giving lists of the kings who ruled in the Sumerian cities of Mesopotamia, and one definitely states that it was written in the fourth or fifth year of Enlil-bani. Since

his reign comes within the range of history, the date of 2141 B.C. has been assigned to these tablets. The lists were very difficult to decipher until two other important tablets were discovered in another part of Mesopotamia, giving further lists of kings who were stated to have reigned both *before* and after the flood. No attempt will be made to enumerate the names. The lengths of the dynasties are impossible ; in two instances they are given as 42,300 and 28,800 years ! It is noteworthy, however, that the names mentioned on the three tablets more or less correspond.

The important sentence on the chief tablet is : *The Deluge came up*: it is inserted in the middle of the list of dynasties. It clearly asserts the fact of a Great Flood, which divided the dynasties from one another.

The first dynasty to rule after the Flood was that of Kish. Then came the first dynasty of Erech. In this list we encounter no less a person than Gilgamesh, hero of the epic poem, as the fifth king. Next came the first dynasty of Ur, the first king of which had the formidable name of Mes-anni-padda, and the second dynasty of Kish, of Erech and of Ur respectively. By this time, the numbers given for the length of the dynasties are becoming more reasonable : for instance, 136 years for the reigns of six kings.

The extraordinary lengths of the reigns led to it being thought that the kings named were mythical personages, but in 1923 the ruins of a temple were unearthed at Tell el 'Ubaid, four miles from Ur, and there an inscription was found giving the name of the god to whom it was dedicated, and the name of the builder, A-anni-padda, son of Mes-anni-padda, king of Ur. This discovery made it clear that the Mes-anni-padda mentioned in the list as first king of the first dynasty of Ur was a real person.

One explanation for the absurd figures given for the earlier reigns is that copyists working about 2000 B.C. may have had difficulty in reading the pictorial scripts.

Before referring to the further discoveries of 1929, it is necessary to consider the evidence of broken pottery. The art of making earthenware pots came down from very early times, before people had learnt to smelt metals for tools and weapons. Good pottery decorated with simple patterns is found in the tombs and rubbish-heaps of races who had only flint tools, and much attention has been given in recent years to the classification, according to shape and forms

of decoration, of pottery found on the sites of early settlements in Mesopotamia. The inhabitants of Ur about 3900 B.C. had obviously no system of scavenging. Every one threw his household refuse over the city wall, and did it so thoroughly during the course of centuries that an enormous rubbish dump was formed, through which Mr C. L. Woolley, Director of the Expedition sent by the British Museum and the University of Pennsylvania, sank shafts in 1929 and made most surprising discoveries. A thin ware, buff with black designs, has been found in very early settlements, and other pottery of a more elaborate shape and polychrome decoration in later ones. Specimens of the earlier buff and black ware have been found in Persia and Baluchistan, at Susa and also near Ur. The first settlement at Susa is now considered by some to date from 5000–4500 B.C., and it had already been surmised that the people who used this particular ware might be the ' dwellers before the Flood ', even before the most recent discoveries had produced confirmation.

In 1929 the excavators at Ur found first the remains of a flourishing city of the third dynasty, dating from 2400–2300 B.C. Below this, was another city with many graves containing not only elaborate ornaments but inscriptions referring to Mes-anni-padda (whom we have already mentioned) and his queen, Nin-Dumu-Nin, and since Mes-anni-padda's name occurs in the list of kings of the first dynasty of Ur, the city is considered to belong to that period. Then came the colossal rubbish-dump, which was deep enough to allow large pits to be sunk for the tombs of kings of an earlier race. Similar tombs of kings buried with the same rites as those observed at Ur were found at Kish, and it is assumed that these date from the time of the first dynasty of Kish, and that Ur may then have been ruled by a vice-regent.

Mr Woolley continued to sink his shaft still deeper in the great rubbish-dump at Ur, and finally came to a layer of solid clean clay, eight feet thick. His workmen thought they had reached virgin soil, but he persisted, and found in the lower strata evidences of earlier settlers, who used flint tools and pottery both plain and painted. What then was the explanation of this layer of clean, unstratified clay, which divided the later races from the early neolithic settlers with their flint tools and black painted ware ? Clearly it must have been the Great Flood, mentioned in the list of kings and in the folklore of the dwellers in Mesopotamia.

By piecing together the evidence of geology, pottery and the lists

of kings, the Great Flood has been dated between 4250 and 4200 B.C., and a tentative outline of that period may be given.

Before the Flood, various groups of neolithic people lived in reed huts at Kish, using polychrome pottery. Others came from further East to Susa, Eridu, Tell el 'Ubaid and Ur, who made use of the buff and black pottery. Then the first group of Sumerians arrived, from where no one knows, bringing the rudiments of a higher civilization in the form of attempts at pictorial script, and possibly the art of making bricks.

The Great Flood drowned all the dwellers in the valley of the Euphrates, except the chief of Shuruppak, called Uta-Napishtim, Xisuthros or Noah, who escaped with his family and birds and beasts in the Ark. Later, a further influx of Sumerians may have occupied the deserted valley, and the first dynasty of Kish may have built the first brick city there. During the long reign of this dynasty the inhabitants of Ur were accumulating the great rubbish-heap which was found in 1929.

Kharga Oasis

by G. Caton-Thompson

THESE brief notes, written shortly after our return from a first season's work on the prehistory and geology of the Kharga Oasis under the aegis of the Royal Anthropological Institute, are no more than a background for the illustrations (figs. 1–11), due to our good fortune in being the first expedition in Egypt to have the use, for a whole fortnight, of an aeroplane placed without restriction for scientific service in field-work.

Readers of Antiquity will not need to be reminded of the debt archaeology owes to its Editor for his persistent advocacy of aerial co-operation, insisted upon long before the value of this new aid in archaeological research had been generally realized even by those professionally interested, and demonstrated by him repeatedly with a wealth of beautiful illustration.

Professional aerial survey and photography have now reached a very high standard : but whilst it is established that in certain types of country their employment is of incalculable assistance to field-archaeology, it is seldom available for use by the average field-worker. The commercial rates, as I found when arranging for the Zimbabwe survey in 1929 on behalf of the British Association,[1] are prohibitive for the average expedition, whose scanty funds are raised by heroic effort only, and require the elimination of all but the bare necessities of transport, material and wages; whilst the co-operation of the R.A.F., even be they within range, cannot for various reasons be relied upon, and in any case precludes the unofficial archaeologist (particularly if a woman) from accompanying the flight, whereby more than half the value is lost.

When, therefore, last summer, I was planning the Kharga expedition—a region where, on a brief visit in 1928, I had observed that

[1] The South African Air Force saved the situation by consenting to do the work for running expenses only—a matter of £75. See G. Caton-Thompson, *The Zimbabwe Culture*, pp. v and vi, and pls. i, ii, xxii, xxiii, xxvii, and Antiquity, Dec. 1929 ' Zimbabwe ', pls. i and ii.

air-survey would be invaluable—I was audacious enough to toy with the thought of private assistance, which would be free from restrictions and official difficulties and delays. Lady Bailey entered with characteristic enthusiasm into my scheme, and it remained but to get release from the official embargo on civilian aviation over Egyptian territory. The goodwill and necessary permission of the Egyptian and British authorities were eventually obtained; and Lady Bailey flew out from England alone, and landed in a halo of dust, beside our desert camp on 17 February last. The early hours of the mornings of her visit were occupied, with one or two exceptions due to bad conditions, in making observations both archaeological and geological over the great Depression and its surrounding desert.

The machine was an ordinary Puss-Moth, with enclosed cabin, which enabled the observer not only to talk with the pilot, but also to make notes and follow the map in complete comfort. The photographs were taken by Lady Bailey herself out of the forward windows, using a Williamson Pistol Aircraft camera, with panchromatic film-pack. The results, five of which are published here, must be judged for what they are—first amateur attempts.

The value of aerial observation on bare desert is great. Not only have we gained a general knowledge of the 1800 square miles of our concession which many seasons of ordinary field-work would not have given, but we have obtained for use next season valuable information as to where the main centres of archaeological interest lie; we also know where *not* to look for them. Miss Gardner found the geological reconnaissance to be as profitable as the archaeological one was to me, and Mr Little, Director of the Geological Survey of Egypt, who was in Kharga at the time, was equally impressed by what could be seen of vaguely mapped regions in a two hours' flight.

Kharga (the ' Inner ' Oasis), the largest though by no means the most prosperous of the five principal Egyptian Oases, is separated from the Upper Egyptian Nile Valley by a broad strip of plateau—the Libyan Desert Plateau—averaging 130 miles in width, and terrible in its desolation. This we traversed on foot, tracing, with growing excitement, the occurrence of palaeolithic, Badarian, and Faiyum cultural elements right across.

The oasis, ninety-nine per cent. of which is desert, the rest being scattered fertile patches around wells, is not geographically an isolated unit, but forms the eastern part of an enormous desert depression, lying over 1000 feet below the level of the Libyan Plateau, scooped out

in Eocene and Upper Cretaceous rocks by erosive agencies of still disputed age and character. The western ' fertile ' areas are known collectively as Dakhla (the ' Outer ') Oasis.

No topographical barrier other than four days' march of waterless desert separates the two oases, both contained within this irregularly-shaped depression ; but their virtual isolation from each other has caused each to develop—or stagnate—on individual lines. Of the two, Dakhla, though 75 miles further from the Nile Valley, is now at any rate far the more progressive, with a population of over 18,000 souls; whereas Kharga, 130 miles only from Luxor and connected with the Valley by a narrow-gauge railway and weekly train, can hardly support half that number.

The prosperity of an oasis community being entirely dependent on its activity in maintaining and extending its precious water supply, it is not surprising to find that in this respect Dakhla is far ahead of Kharga. That this has always been the case is not however borne out by the buildings of antiquity still standing. In these Kharga is more richly provided than Dakhla ; and though it is true that the majority are outpost stations of sun-dried brick, such as are shown in figs. 3 and 5 guarding the main caravan routes for which Kharga is the more important junction, yet our aerial inspection of the now desert ground of both oases showed extensive and widely distributed areas of ancient cultivation and mining activities in Kharga, which were not observed in an equal degree in Dakhla.

The history of these oases is very little known. By allusion we know that they belonged—nominally at any rate—to Egypt in the Middle Kingdom, and during the New Empire they paid tribute to their masters. But in the oases themselves—perhaps because they have been little explored—nothing has yet been discovered of dynastic antiquity greater than the XXVIIth (Persian) dynasty 525–338 B.C. With the exception however of a solitary temple of that date,[2] ruins of the Classical Period (332 B.C. to A.D. 640) form the remainder of visible buildings.

The main outline of the geology of the water supply of the Oases has been established by those two great pioneers of desert geology, Dr John Ball[3] and Mr H. J. L. Beadnell,[4] and the archaeologist seeking

[2] Our air photograph of this, the Temple of Hibis, was published by *The Times*, 13 April 1931, and the *Illustrated London News*, 2 May, 1931.

[3] *Kharga Oasis : its topography and geology*. Geological Survey Report 1899.

[4] *Dakhla Oasis : its topography and geology*. Geological Survey Report 1899.

to sketch in on a blank sheet the prehistoric and early historic picture of the Depression will be wise to attend to it, for water-colour seems likely to be his medium. Two water-bearing strata have been distinguished—an upper, named the Surface-water Sandstone, which has a wide outcrop ; and a lower, the Artesian-water Sandstone, which can be reached by bore-holes only at not less than 80 metres below the surface. The water carried by these two beds of porous Cretaceous sandstone is believed to have its origin in the rain-belt of Equatorial Africa.

The great majority of the existing flowing wells, both ancient and modern, derive their supplies from the water under pressure of the lower series. By whom the first wells in the oases were sunk is still unknown : it is easier to call them Roman, as is usually done, than to prove it, and I cannot dismiss the suspicion that closer inquiry may show Persian handiwork, particularly in the great subterranean aqueducts to which I shall refer. In Dakhla, over 400 pre-Arab wells are still in use, and in Kharga nearly all the existing ones are of ancient boring, besides the large numbers which have become derelict through man's neglect (several are seen in fig. 1), or have been forcibly abandoned under pressure from the irresistible seas of sand (fig. 9).

But whilst the evidence shows that in some still-undefined period wells tapping the deep-seated artesian water were the rule, exceptions were made when this source of supply was unobtainable, and the Surface-water Sandstone was also utilized. Particularly is this the case in those higher lying districts near the base of the scarps, where the water has been carried to the remote outpost stations referred to in long subterranean rock-cut aqueducts as much as 175 feet below the surface, whose perilous exploration Mr Beadnell so vividly describes.[5]

The clue to the positions of these aqueducts is given by the upthrow from, or openings of, narrow vertical shafts which connect them with the surface, sunk doubtless as much for ventilation as for the removal of the excavated material. Considering the labour required in the cutting of each of these shafts, the closeness with which they were spaced is almost incredible : Mr Beadnell cites a row over two kilometres ($1\frac{1}{4}$ miles) in length where the spacing was between 19–20 metres (61–64 ft.)—over 150 shafts in all. The lines of these subterranean aqueducts were spotted with wonderful ease from the air, and several lengths will be seen on fig. 2, serving, in what is now complete desert,

[5] *An Egyptian Oasis*, chap. XII.

PLATE I

FIG. 1. AIR PHOTOGRAPH (4000 ft.) SHOWING ANCIENT AND MODERN CULTIVATION AND IRRIGATION NORTH OF KHARGA VILLAGE
The clustered dots at the top are the domed tombs of the Early Christian Necropolis
Ph. The Hon. Lady Bailey

facing p. 224

PLATE II

FIG. 2. AIR PHOTOGRAPH (3000 ft.) OF ROMAN OUTPOST OF QASR GYB, KHARGA DEPRESSION
showing aqueducts and shafts
Ph. The Hon. Lady Bailey

FIG. 3. QASR GYB, EXTERIOR
with the R.A.I. Expedition at base
Ph. E. W. Gardner

FIG. 4. QASR GYB, INTERIOR
showing barrel-vaulted chambers of mud-brick
Ph. E. W. Gardner

FIG. 5. DEIR EL GHENNÎHMA: ROMAN OUTPOST FORTRESS IN KHARGA DEPRESSION
R.A.I. Expedition's Camp in foreground
Ph. E. W. Gardner

FIG. 6. GORN EL GENNAH, KHARGA DEPRESSION
Shafts of subterranean aqueduct, over 260 ft. in depth
Ph. E. W. Gardner

FIG. 7. AN OASIS IN KHARGA DEPRESSION : overflow pool from Ain Kharrau, threatened by sand-dune
Ph. G. Caton-Thompson

FIG. 8. KHARGA DEPRESSION : undisturbed flint implements by a 'fossil' spring. Scarp in distance
Ph. G. Caton-Thompson

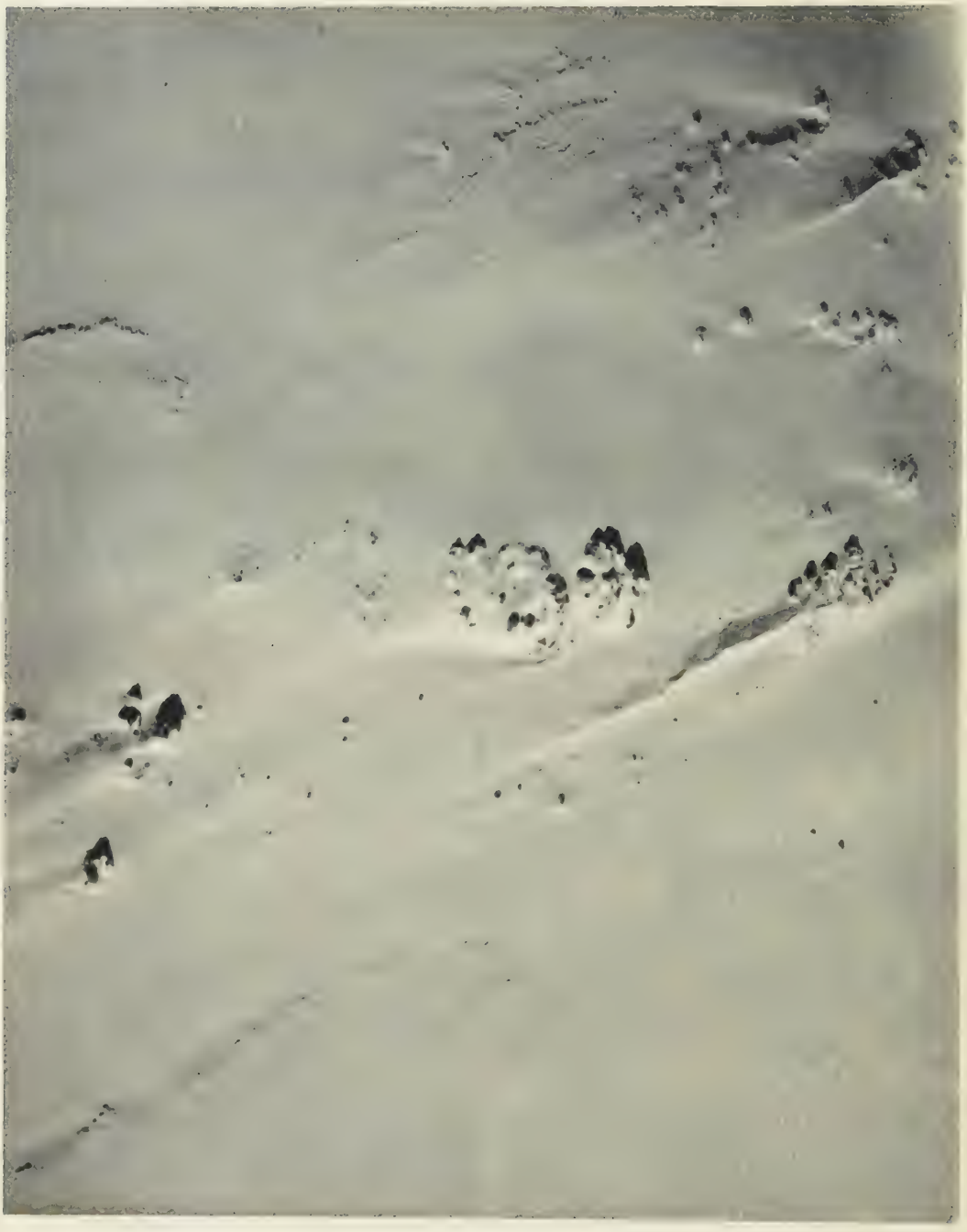


FIG. 9. AIR PHOTOGRAPH (4000 ft.) OF A SAND-SWAMPED OASIS IN THE GREAT DUNE-BELT, SOUTHWEST KHARGA

Ph. The Hon. Lady Bailey

PLATE VII

FIG. 10. AIR PHOTOGRAPH OF QASR GHUATA, A PTOLEMAIC TEMPLE IN KHARGA DEPRESSION
showing ancient and modern irrigation channels
Ph. The Hon. Lady Bailey

FIG. 11. AIR PHOTOGRAPH OF DIMÊ (5000 ft.) NORTHERN FAIYUM DESERT
The Soknopaios Nesos of Classical Times, with irrigation embankments
Ph. The Hon. Lady Bailey

the little outpost building of Qasr Gyb, seen on the prominent mound in the air-photograph, and in figs. 3 and 4 from the ground. The structure, as well as the sherds picked up point to a late Roman date for this place. Traces of ancient cultivation and mineral workings can be made out in the vicinity, and the position seems designed to guard the northern exit from the Depression by the Darb el Arbain. Here caravans would get their last water and grazing before reaching Assiut, about 100 miles distant.

The openings to the shafts of another subterranean water system 35 miles south of Gyb, first spotted from the air, are seen in fig. 6. Here, though we plumbed one to a depth of 82 metres (261½ ft.) without reaching bottom, the openings are set even closer together. In this case, however, the water-tunnel is almost certainly a short one. Another row, not yet visited on foot, is prominent in fig. 1 but whether these mounds will prove to indicate a subterranean channel is not yet clear ; surface irrigation as still practised, and seen in the air photograph fig 10, may create something not dissimilar ; for in the photograph we see two wells, whose flow is canalized for some miles across the desert, each creating its own little thread of ' oasis ', and whose periodic dredging doubtless causes a long line of mounds. The square outline of the Ptolemaic temple of Qasr Ghuata lies nearby, and that the same well was flowing over 2000 years ago is shown by the rectangle of irrigation mounds which borders it.

Some ancient surface irrigation channels were faced with stone : one such I cleared of sand for a short distance, and found it to be little more than a ditch whose sides were held in place by undressed, unmortared stone.

The relation of prehistoric man to the water-supply has already proved, in the lapse of one short season, an exciting study. We are unable to agree with the view that Kharga Depression, at any time within the span of man's appearance in it, contained a lake or continuous marsh ; and the deposits which have been thought to prove it appear to us to be of composite origin due largely to the local overflow from springs. A tour of the Depression by air confirms this view, already reached by ground work.

Where then did palaeolithic and neolithic man, whose implements lie in incredible numbers on the scarp and in the Depression, obtain his water ? The artesian water is inaccessible to all but deep bores, and on the existing evidence must be dismissed, in palaeolithic times at all events, as a possible source of supply.

Yet at first sight the only alternative, in the absence of a lake, is the Surface-water Sandstone bed, a source which, without the aid of considerable hydraulic skill, now lies too stagnant in its own stratum to discharge under pressure, or accumulate in more than small, isolated pools, in rare, tectonically favourable spots. We have begun to find the true explanation.

A noticeable feature of the oasis floor are curious crater-like mounds of hardened sand-rock, tending to cap ridges. One such ridge, marked by a crest of 'craters' attracted my attention owing to the profusion of beautiful flint implements, both of Mousterian type, and of Faiyum neolithic affinities, upon it (fig. 8), each type confined more or less to its own half of the ridge. The palaeoliths—cores and flakes of china-white patination totally unlike anything I had seen in Egypt except *in situ*, were concentrated around the base of a 'crater'. A trench across it disclosed a 'floor' of palaeoliths deeply buried, and further sections showed the 'crater' to be spring deposits of Pleistocene age, 9 metres in depth, of alternating clays, loams and pure white sands. The character of deposition suggests successive phases of quiescence and discharge under terrific pressure, the loam beds indicating a placid pool fringed by reeds and vegetation, the comminuted and distorted clays the periods of violent activity. The water, almost without doubt, was seated in the Surface-water Sandstone, and we have thus gained an insight into the capacity of this stratum to discharge under pressure in Pleistocene times.

The associated culture, which is figured provisionally in *Man*, May 1931, plate E, is notable as belonging apparently to a branch of the Aterien of French North Africa.

Dissection of another 'fossil' spring at the other end of the ridge disclosed a later Stone Age culture, similarly deeply buried. We are thus already at grips with the prehistoric water-problem.

Experience teaches the field-archaeologist to be a cautious creature: nevertheless, if restrained speculation be permissible, I see in the Pleistocene 'fossil' spring deposits of Kharga Oasis, with their local overflows, just such an environment and circumstance as might be held to have led man, the palaeolithic hunter, to become man, the 'neolithic' herder and cultivator.

Notes and News

A NEOLITHIC VILLAGE NEAR COLOGNE

We print below a translation (by Dr Cecil Curwen) of the first report* on the excavation of a neolithic village in the outskirts of Cologne. It belongs to the band-keramik culture, and although so far no startling or unusual features have been observed, it is to be hoped that it may be possible to excavate it completely. The work is being carried out with the utmost care and thoroughness by the officers of the Roman department of the Wallraf-Richartz Museum, Cologne.

In the autumn of 1928 some dark occupation-sites containing shards of band-pottery were cut into during alterations in the district between Dürener Strasse, Militär-Ringstrasse and the Frechener Brook, west of Lindenthal, Cologne. The discovery appeared to be of such importance that I immediately raised a protest against the removal of the site of the discovery and the projected complete demolition of it for obtaining soil for the new Botanical Garden. However, after various difficulties it was possible to begin the scientific exploration of the site on 1 August 1930.

Expectations were not disappointed, but were even excelled. For it was a question of nothing less than a complete village with its numerous huts, the whole surrounded by a fortification. By far the commonest ground-plan is the so-called curve-complex of kidney-shape, with depressions of varying depth in the floor, and of varying circumference due partly to much later enlargements and additions to the buildings. While elsewhere only very few post-holes have been found in connexion with such ground-plans, here they are freely established. This much is certain, that we are dealing with actual hut-sites. Moreover, isolated rectangular buildings also occur, as for instance a magnificent building over 66 feet (20 m.) long with post-holes in the interior and beside both its longer sides ; this lies in the west part, immediately beside the ditch. In its interior, however, neither a hearth-place nor, in general, relics

---

*Published in *Germania*, Jahr xv, heft 1 (Jan. 1931), pp. 49, 50, by Fritz Fremersdorf. Plan of site so far as at present excavated.

of occupation are forthcoming. So far it is already to be observed that the ditch respects this building. Round the whole lies a ditch about 17 feet wide (5 m.) and 7 feet deep (2 m.), behind which there follows at a greater distance a palisade which is recognized by narrow dark streaks with posts extending in front of them. In the filling of the ditch, and of course immediately above the bottom, shards of band-pottery have been found, so that the ditch may be considered to be contemporary with the settlement. For the hut-sides contained a mass of pottery, smooth or decorated in various ways with band-patterns ; also flint implements, simple querns, animal bones, and isolated pieces of burnt daub. In more than one case cellars or rubbish-pits have been found.

What the plan also shows is its splendid state of preservation. It seems to be conditioned or at least favoured by a covering stratum about 20 inches (50 cm.) thick, which makes a definite contrast and lies above the occupation level and below the humus ; possibly this is a deposit left by the neighbouring Frechener Brook. With regard to the technique of the excavation it may be said that we clear long strips, 23 feet (7 m.) wide down to the beginning of the occupation level, and then make a smooth surface with the help of specially prepared scrapers. The dark spots of changed colour then show up with very great distinctness, so that they can even be photographed. All hut-sites were completely shown up for establishing the nature of their pits, and therewith accurately explored for their contents. Post-holes were without exception opened up ; once in order to determine them as such with certainty, and then also to determine whether the posts were arranged in pairs in an upright or oblique position; hitherto they have been found to be exclusively vertical.

The fact is important that hitherto only sporadic remains were found belonging to a later period, as for instance some rubbish-pits without post-holes with Hallstatt shards, also larger post-holes which are arranged in a rectangular plan ; as the latter never contain any kind of relics of occupation they may well be looked upon as store-houses. If one takes into consideration that the contents of the huts in pottery is not very rich, the assumption is perhaps justified that this village was only occupied for a short time. Its extent from east to west amounts to 660 feet (200 m.) ; from north to south it can be provisionally estimated as amounting to at least 500 feet (150 m.). Up to the present about 4200 square metres of the area have been systematically explored.

Here we have the very rare case that the entire plan can be recovered, as it lies in the open country, and the advantageous situation guarantees an uninterrupted acquisition of the ground-plan of the huts. Very gratifying is the extensive support hitherto received through Dr Adenauer, the chief burgomaster, who out of his management fund placed at our disposal the means of paying for scientific assistance in the continuous superintendence of the work. Further, thanks are due to Burgomaster Dr Schwering, the leader of the town's Welfare Committee, for the rapid progress of the work as a result of the grant of a greater number of free emergency workmen.

The object of this short report is before all to draw the attention of fellow-students in excavation, and to invite them to visit us. The large rectangular building by the western ditch will be kept open as a preliminary ; besides, in the next few months it will always be possible to see larger continuous areas, either after being uncovered and before being explored, or after the working out of the occupation level and thus after the completion of the exploration. In the office of the Roman section in the museum is a small selection of the finds forming a representative collection. As for the rest, Dr Werner Buttler, to whom the local charge of the excavation is assigned, will soon report on its progress here.

GOODWIN SANDS AGAIN

We are indebted to one of our readers, Miss ALICE D. GREENWOOD, for pointing out that the story of Goodwin Sands and Tenterden steeple originated in the middle of the 16th century. Latimer referred to it in his last sermon, preached before Edward VI in 1550, and there is a graphic record in the ' Workes ' of Sir Thomas More, printed in 1557, which we give below.* We would point out that, although Tenterden has connexions with Thanet both by name and custom, the story rings true of the English rustic, and is probably the fountain-head. As our correspondent points out, Sir Thomas More most likely encountered and cross-examined the 'old father ' as a witness before the commission appointed to enquire into the cause of the decay of Sandwich haven.

' And nowe where thei laie for a proofe, that God were not contented wyth battayle made againste infidels, the losse and mynyshement

* From ' The workes of Sir Thomas Moore ', 1557 [Bodl. reference, Douce M.M. 398]: book IV, chapter 14, p. 277.

of Christendome synce that guyse beganne, they fare as dyd once an olde sage father fole [sic] in Kente at suche tyme as divers men of worshippe assembled olde folke of the countrey to commune and devyse aboute the amendemente of Sandewyche haven. At whiche tyme as they beganne fyrste to ensearche by reason and by the reporte of olde menne there about, what thing had bene the occasion that so good an haven was in so fewe yeares so sore decayed, and suche sandes rysen, and such shalowe flattes made therwith, that right small vessels had now muche worke to come in at dyvers tydes, where great shippes wer within fewe yeres passed accustomed to ryde without difficultie, and some laying the fault to Goodwyn sandes, some to the landes Inned by dyvers owners in the Isle of tenate out of the chanell, in which the sea was wont to compasse the Isle and bryng the vessels rounde about it, whose course at the ebbe was wont to scoure the haven, whiche nowe the Sea excluded thence, for lack of such course and scouryng is choked up with sande, as they thus alledged, divers men, divers causes. There starte up one good old father and said, ye masters say every man what he wil, cha marked this matter wel as som other. And by god I wote how it waxed nought well ynough. For I knewe it good, and have marked so chave, whan it began to waxe worse. And what hath hurt it good father, quod the gentlemen ? By my fayth maisters quod he, yonder same tenterden steple and nothyng els, that by the masse cholde twere a faire fish pole. Why hath the steple hurt the haven good father quod they? Nay byr Ladye maisters quod he, yche cannot tell you well why, but chote well it hath. For by God I knew it a good haven til that steple was bylded, And by the mary masse, cha marked it well, it never throve since. And thus wisely spake these holi Lutheranes, which sowyng scismes and sedycions among christen people, laye the losse thereof to the withstanding of the Turkes invasion, and the resistyng of his malice, where they should rather yf thei had any reason in theyr heades, lay it to the contrary '.

SIR AUREL STEIN'S DISCOVERIES IN CENTRAL ASIA

An exhibition has been held at India House, Aldwych, London, of a collection of textile remnants recovered from desert soil on his third Central-Asian journey in 1913–16 by Sir Aurel Stein, the famous explorer and archaeologist, and which belongs to the Government of India.

Of the more important textile fragments from the expedition shown at the British Museum in 1925, some have already been returned to New Delhi. The recent exhibition comprised the residue of the tissues then shown, together with a further selection of fabrics which, owing to their perished and fragile condition, it has not yet been possible to display. All this material has now, by order of the Government of India, been as far as practicable restored and mounted and will also be returned to India very shortly.

The earlier group of exhibits, assigned by Sir Aurel Stein to a period extending from the middle of the 1st century B.C. to about the first third of the 2nd century A.D., *i.e.* to the period of the Han dynasty, was excavated from grave-pits in a ruined cemetery at a site of what was once the Lou-lan territory and is now part of the Lop desert. In his introduction to 'Ancient Chinese Figured Silks', a paper published in the *Burlington Magazine* in 1920, in which Mr F. H. Andrews, late principal of the Kashmir Technical Institute at Srinagar, discusses the materials, methods of weaving, and character of the designs of certain especially interesting silks found at this site, the explorer claims that these fabrics represent the oldest surviving examples so far known of the Chinese silk industry and textile art. Such abundance of textile remains, so Sir Aurel Stein tells us in his official report on his third Central-Asian journey (*Innermost Asia*, Clarendon Press, Oxford, 1928), we owe to the Chinese custom of bandaging the dead in closely wound rags of old clothing. These tattered remnants rarely give a clue to the character of the particular garment to which they belonged, but their technical and artistic interest is great and their state of preservation wonderful. Silks, patterned and plain, predominated, but fabrics of wool and cotton or hemp were also found. Particularly remarkable are a number of fragments of knotted pile carpet, worked in a variety of colours, and differing neither in appearance nor in weave from the carpet of today.

The second group, which dates from the seventh to about the fifteenth century A.D., consists mainly of silks from tombs of the Astana cemeteries in the Turfan district. These Astana silks, in contrast with the Lou-lan ones, so robust in colour and purely Chinese in conception, give evidence of contact with Western taste in design. Their range of colour is wider and their pattern inclines to repetition, both vertically and horizontally, of a relatively small unit of design. The damasks, striped and diapered silks, silk tapestry, and gauzes of this group, included some striking fragments from Khara-khoto, the famous Etzina of

Marco Polo, as well as some remnants of printed silk produced by a similar process to the modern ' Batik ' work. The work of restoring and mounting was entrusted by the Government of India to Miss Joan Joshua, who has, since 1924, assisted Sir Aurel Stein in various literary and artistic capacities.

PHOTOGRAPHING ARCHAEOLOGICAL FINDS

Mr Ernest Mackay, of the India Archaeological Survey, sends the following note from Mohenjo–Daro, Sind :—

Most archaeologists, and especially those in the field abroad, soon realize that if shadows are to be obviated they must photograph their finds on glass from above. This method is also useful when the shapes of the objects to be photographed preclude their being supported in a vertical position.

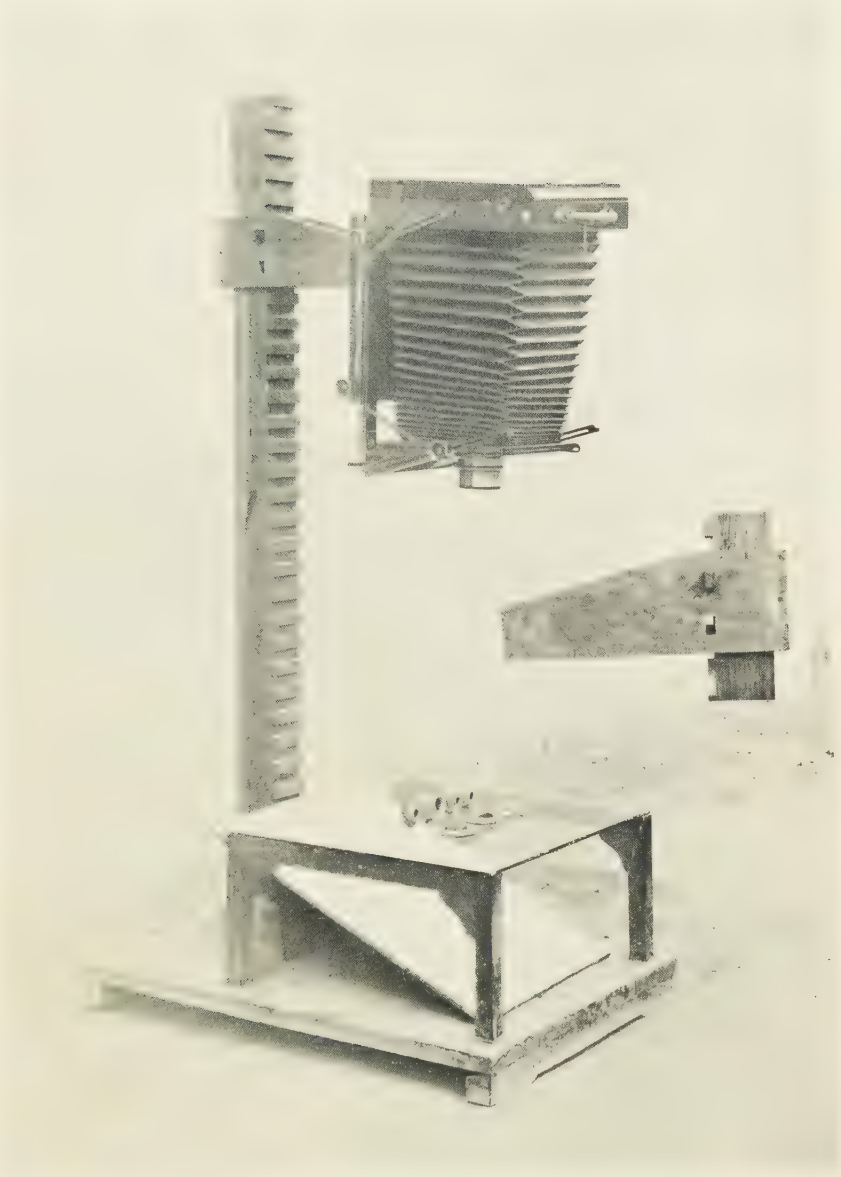
There are many pieces of apparatus on the market for this class of photography, but they are expensive and liable to get out of order at critical moments or far from any means of repair.

With these difficulties in mind, I have devised a simple stand that is capable of doing a great deal of useful work. The material of which it is made can be procured anywhere, and even a comparatively unskilled native carpenter can make it.

The photograph shows a post 6 ft. 2 ins. high fixed by an incut step to a base 3 ft. 4 ins. by 3 ft. 2 ins. in size. The post is 4 ins. square and can easily be removed from the base if desired. Here we have had the post to fit rather loosely in the stand so as to allow for expansion during the monsoon, but a wedge between the post and base makes it quite rigid.

Down the front of the post square-cut slots are made, at intervals of 1 in., each 1 in. high by $\frac{1}{2}$ in. deep. These slots are preferably cut in the post, but they can be made by fastening slips of wood 1 in. wide and $\frac{1}{2}$ in. thick to the post at the proper distance of 1 in. apart. I prefer the slots to be cut as being stronger, and also because they are less trouble to make in this way.

The open frame-like arrangement to which the camera is fastened in the usual way easily slides up and down the post. On each side of it holes are cut for the reception of a pin, each of which measures 1 in. high and $\frac{1}{2}$ in. wide to correspond with the slots on the post. If there is only one hole in each side of the frame, the operator can adjust his camera at intervals of one inch. But if two holes, one below the other,



APPARATUS FOR PHOTOGRAPHING ARCHAEOLOGICAL FINDS

facing p. 232

be cut at a distance of $\frac{1}{2}$ in. or preferably for strength $1\frac{1}{2}$ ins. apart, as shown in the photograph, the removal of the pin from the upper to the lower slot will bring down the range of the camera to within half an inch. By providing three or even more slots, the adjustment of the camera can be brought down to a quarter of an inch or even less. I find that with the modern lens it is only necessary to be able to move the camera by half inches and that a small stop will do the rest.

The rectangular pin by means of which the sliding frame is engaged with the slots in the posts measures a trifle less than 1 in. by $\frac{1}{2}$ in. To allow of expansion in wet weather our frame also is slightly larger than it need be ; but a small easily removable wedge prevents shake. With this apparatus, it may be added, it is quite impossible for the box ever to become accidentally loose so that any damage to the camera, through slipping, is obviated.

The post can be marked so that the frame can at once be set to give the desired degree of enlargement or reduction. For convenience in transport, the supports upon which the plate glass rests can be removed, so that they can be packed conveniently together with post, stand, and sliding frame.

This simple piece of apparatus is in constant use in our excavation camp and elsewhere, and it has never let us or itself down.

NIEDERMENDIG LAVA ROCK NEAR AVEBURY

Mrs M. E. Cunnington sends us the following note :—

It may be remembered that the Kennet avenue at Avebury, as described by Aubrey and Stukeley, ended at two rings of standing stones on Overton Hill. According to Stukeley the rings were known locally as ' the Sanctuary ' ; he records their final destruction in the year 1723. Since then even the exact site had been lost until it was re-discovered last summer (1930) and the site excavated.

The holes in which the two concentric circles of stones had stood were found, and quite unexpectedly six rings of holes, concentric with the stone holes, which once held timber posts.

The pottery found consists of fragments of West Kennet long-barrow type and of beakers. A beaker was found with the only burial on the site. There can be little doubt, therefore, that the circles were erected in the Early Bronze Age, apparently at the period of overlap of the cultures of the long barrow and beaker people.

The evidence suggests that the stone circles were not contemporary

with, but rather later than those of timber. The plan of the timber construction apart from the stone circles has much in common with that of Woodhenge. Some of the post-holes are of great size and must have held large timbers. The use of timber at all in the centre of this sarsen country, where innumerable stones shaped and hewn by nature were lying close at hand, is remarkable, and shows that in prehistoric times timber was not only used as a substitute when stone was not available, but in this case at least was actually chosen in preference to stone.

The purpose of this note is to make known the discovery of pieces of lava rock from Niedermendig in the Eifel, Germany, in one of these post-holes. The rock has been identified by Dr H. H. Thomas, who says there can be no doubt about its place of origin. About twenty small, roundish, much weathered fragments, none showing signs of use, were found scattered through the lower half of a large, 5 ft. deep post-hole. Nothing later than beaker pottery was found in the holes, and there is no reason to think that this particular one was in any way disturbed at a later date. The fact, indeed, that in this hole a core was observed denoting the position and decay *in situ* of the timber upright, proves that it had remained undisturbed since the decay of the timber.

This being so it is hard to get away from the inference that the lava rock was brought to this country by beaker-using people coming from the Rhineland. It may have been brought as a mealing stone for rubbing or grinding corn. A corn grinder must have been a household necessity in daily use, and therefore an object likely to have been carried by an immigrating people. In the course of time the stone was broken, and fragments may have found their way into the filling of this hole, along with other rubbish from the surface such as potsherds, bones of animals, and so on.

Previous to this discovery at the Sanctuary there seems to be no record of this rock associated with pre-Roman remains in Britain, but in Roman and medieval times it was imported for mill stones.*

It was, however, worked and used for mealing and rubbing stones by people in a neolithic stage of culture in the Rhineland (Michelberger,

* In the German publication referred to below mention is made of the discovery of Niedermendig lava in a Pict's mound (Pictenwall) in Scotland, and Dr Brink in the *Mayener Geschichtsbuch*, is quoted as the authority for the statement. On enquiry at the National Museum of Scotland, Mr J. Graham Callander tells me that nothing is known there of this alleged discovery.

Pfallbau). There is said to be no direct evidence of its use there between the Neolithic and the early Iron Age Hallstatt period, when it was much used and continued so through La Tène, Roman and later times. It can hardly be doubted, however, that this rock was used by beaker people in the Rhineland. The lack of evidence of its direct association with beakers is due probably to the fact that mealing stones are not usually found in graves, and that few of the living sites have been investigated. In the great earthwork of Urmitz (interrupted ditch type) between Coblenz and Cologne, built by Michelberger, and later occupied by beaker people, mealing stones, etc., of this rock are found.

The early mealing stones of this rock from the Rhineland are identical in shape with the so-called saddle querns with which we are familiar in England from Early Iron Age sites.

Perforated hammer or axe heads were occasionally made of this rock.

I am indebted to Herr Georg Kraft of the Freiburg Museum for information as to the use of lava rock in the Rhineland, and for reference to a paper on the subject entitled ' Die Basaltlava-Industrie bei Mayen (Rheinland) in vorromischer und romischer Zeit', *Mannus*, band VI. (*Zeitschrift für Vorgeschichte*, 1914). A full report of the excavations at the Sanctuary will appear in the June number of the *Wiltshire Archaeological Magazine*.

HISTORICAL STUDY BY FLUORESCENCES

Mr L. V. Dodds writes :—

Further interesting work has recently been completed in the study of fluorescences emitted by the inks of manuscripts and the like when examined beneath ultra-violet rays.* It is by this method that many palimpsests have been deciphered and much information gained of value to historical study. So far not a great deal of work has been done at the British Museum, but the initial researches are of considerable interest.

The ink of papyri and the inks of later periods containing such reagents as gallic acid have so far proved inert to the rays, but there is considerable scope for further study and in Germany it has been found that some papyri can be examined successfully by this method.

* A note on deciphering palimpsests by Mr L. V. Dodds is printed in Antiquity, 1929, III, 219–21.

Some interesting results have been obtained by Professor Manly and Professor Rickert, who are investigating the names and markings scribbled on Chaucer MSS. The fluorescences excited by the rays enabled a number of these to be read which were immune to other methods, while other doubtful or illegible markings have been confirmed.

In this particular branch of study experience at the British Museum has shown that in some cases reasonably good results are obtained, while in others little more comes up than can be seen with the naked eye.

Dr Cellerier, of the Musée du Louvre, has obtained satisfactory results in the examination of paintings for signs of retouching, and some pictures, the origin of which was in doubt, have been identified as the work of a particular artist. All types of rays have been used by Dr Cellerier and his colleagues and it is stated that the great advantage of the ultra-violet group is that no damage is done to the painting during the examination. One interesting and not unhumorous result of this work is that one or two minor paintings in the Louvre which were believed to be original have now been found to be copies by a much less-known brush.

While this means of using ultra-violet rays is important, there is another application which may become of much greater value to the student. Dr Cellerier has shown that the actual method of working used by the artist can be studied by this means. The varying brush strokes are clearly seen, and it seems possible that some knowledge may be gained of the skilful technique by which some of the old masters achieved their effects. Special consideration is now being given to this most interesting problem.

KING ARTHUR'S LAST BATTLE

Neither the place nor date of any of King Arthur's twelve battles are known.* Doubt has even been cast upon his existence; and it has also been suggested that he may have been the same person as Aurelius Ambrosius. We do not however think that either of these opinions about him can be maintained. We believe that he was a historical person, distinct from Ambrosius and probably his successor as Dux Bellorum or Wledig.

The evidence of Gildas, who does not mention Arthur, suggests, if it does not prove, that Ambrosius preceded Arthur; but Gildas gives no

*An article on Arthur's battles by Mr W. G. COLLINGWOOD is printed in ANTIQUITY, 1929, III, 292–8.

precise or intelligible chronological data. Such are provided by a passage in the 'Historia Britonum' of Nennius which has been strangely overlooked by historians.[1] The passage quoted evidently refers to a battle in a civil war between Britons and other Britons, not between Britons and Saxons. This is proved by the fact that Guitolinus, whoever he may have been, has a Roman name, and by the use of 'discordia' rather than 'bellum' to describe the battle. Its date is indicated by the statement that it occurred '12 years after the reign of Guorthigirn'. This evidently does not mean after his death but after the time when his effective leadership came to an end. No ancient author states in what year this happened, though 'Nennius' gives some rather difficult facts in his chronological table.[2] We can however infer it within certain limits. Vortigern was certainly reigning when Hengist and Horsa came to England and were peaceably received by him; he was certainly not reigning in 455 when Vortimer, as Dux Bellorum presumably, fought a battle recorded under this year in the 'Old English Chronicle'.[3] Twelve years after this, when the Battle of Wallop occurred, would be 467. That gives us, within reasonable limits, a date for Aurelius Ambrosius, and this, so far as I am aware, has not hitherto been possible. It probably represents an early episode in his career, and may even mark his emergence as Dux Bellorum. The years preceding may have been spent in civil strife with other British leaders who desired this title; there is evidence for such strife in Gildas.

---

[1] 'Et a regno Guorthigirni usque ad discordiam Guitolini et Ambrosii anni sunt duodecim, quod est Guollopum, id est Catguoloph. *Chronica Minora*, ed. Th. Mommsen, vol. III, (Berlin, 1898), p. 209.

[2] An attempt to reduce these facts to order proved unsuccessful, for they are mutually irreconcilable.

[3] The 'Irish Nennius' (Todd's edition, 1848, p. 99) says that Vortimer 'rose up against Hengist and Horsa' after Vortigern had retired (probably under pressure) to the west. Then follows an account of his four battles with them, culminating in a victory on the coast. We obtain the date of one of these battles, A.D. 455, from the O.E. Chronicle. The names differ in the two accounts, but the battles can be identified by the fact that in each is the statement that Horsa was killed at one of the battles. The Chronicle states that 'Wurtgern' was the British leader, but this may well be an error for Vortimer his son who is not mentioned in the Chronicle. I prefer to follow the comparatively full and here quite consistent stay of events given by 'Nennius'; but in any case, since this is the last mention of Vortigern in the Chronicle, the argument is not affected.

A cross-bearing on this evidence is obtained from another statement of Nennius, that Pascent, third son of Vortigern ruled over Buelt (Builth) and 'Guorthegirniaun' by favour of Ambrosius (largiente Ambrosio illi) after the death of his (Pascent's) father. The date of Vortigern's death is not known; the date of 484 is given by the 'Annales Cambriae', but this, though possible, is inconsistent with other evidence.

Roger of Wendover's date for the 'accession' of Ambrosius, A.D. 465, agrees well with the evidence here cited but has no independent authority,[4] being taken verbatim from Geoffrey of Monmouth.

With regard to the site of the battle, there can, I think, be little doubt that it was somewhere on the river Wallop in Hampshire.[5] I see no reason why Amesbury should not contain the name of Ambrosius; and if one may trust the Welsh Triads, he was associated with Stonehenge before the days of Geoffrey of Monmouth. It is in just such a region as Central Wessex that one would naturally place his activities.

The bearing of all this on the date of the Battle of Mons Badonicus[6] may now be considered. The whole theory depends upon the interpretation of the well-known 'difficult' passage in Gildas. Mr Nicholson suggested[7] that Gildas's 44 years should be reckoned from the emergence of Ambrosius, counting forward. If we assume that his emergence is represented by his 'discordia' with Guitolinus at the battle of Wallop, we get the date 511 (467+44) for the battle of Mons Badonicus.

It is not however quite certain that this was his *first* appearance. The 'Irish Nennius' states that, when he retreated into the north, Vortigern 'left the fortress [which was *not* Caer Vortigern] to Ambrose, and also the government of all the west of Britain'.[8] We have already suggested that this retreat marks the end of Vortigern's reign, and that it occurred in or shortly before 455. This would give (455+44=) 499 for Mons Badonicus. In either case we obtain a reasonable date. We get the period 455 to 467+ as the 'Floruit' of Aurelius

[4] cf. W. H. Stevenson in *English Historical Review*, XVII, 631.

[5] Can this be the 'fontem Galabes, in natione Gewisseorum' where according to Geoffrey of Monmouth, the messengers of Ambrosius found Merlin, before the building of Stonehenge? (ed. Giles, 1844, p. 140: book VIII, ch. 10).

[6] There were two battles of Mons Badonicus. The first, which is the one here in question, is mentioned by Gildas, Bede, Nennius and the 'Annales Cambriae'; the second between Cenwalch and the Britons, by the 'Annales Cambriae' only (under the year 667, corrected date).

[7] Quoted in Oman, *England before the Norman Conquest*, 1910, 201 (valuable notes summarizing current views on the problem).

[8] Todd, p. 99.

Ambrosius; and we must place King Arthur and his twelve battles within the period whose extreme limits may be given as 467–516. (This later date is that of Mons Badonicus, according to the 'Annales Cambriae': Arthur is said to have lived 21 years after this). A closer but of course still more conjectural dating would lie within the period 485–511. These dates agree quite well with what little we know of the general history of the period; and tested by allowing 30 years to a generation they are found to be quite consistent. The same calculation suggests a date of round about 410 for the birth of Vortigern.

COLCHESTER

Mr Christopher Hawkes, of the British Museum, sends us the following note on the present season's work at Colchester:—

The Colchester Excavation Committee's work of exploring the site of the Celtic city of King Cunobelin, which lies under the threat of road-building and 'development', fully justified last year the forecasts of its importance made in Antiquity and elsewhere. The new By-Pass road had been planned to run right across the northern part of the Celtic site, as well as over certain Roman sites north of the Colne, and excavation had to be undertaken at very short notice.

The main site examined, on Sheepen Farm, had been intensively occupied during the half-century preceding A.D. 43, when the city was captured by the Roman Expeditionary Force, and its life was thus roughly contemporary with the reign of Cunobelin. The material culture of the inhabitants was revealed in striking detail: the structural remains comprised those of timber houses with earth and clay floors, open hearths, and drainage, rubbish, and palisade-trenches, interspersed with pits, some of great size, and wells, three of them with well-preserved timber linings of varying types. Pottery was found in very large quantities, and it is of the greatest interest, for along with native fabric of the 'Swarling-Aylesford' and also hand-made earlier types, there appear Roman provincial and Italian wares ranging in date from Augustus to Claudius, and proving importation of such products on a large scale from the Rhineland, Northern and Southern Gaul, and Italy, throughout the half-century preceding the Roman Conquest (see pls. 1–2). The brooches and other bronze objects, and the British, Gaulish, and early Roman coins also deserved close attention: in fact, the civilization of the Britons and its interaction with the growing influence of Rome could be studied in detail for the first time on the most valuable site for the purpose in the whole country.

It was further expected that the site should reflect the events of the Roman military conquest, and the tentative examination was begun of a large ditch of military pattern, which can hardly be unconnected with the coming of the army of Claudius.

But the Committee's policy of examining everything on the line of the new road had also unexpectedly to be extended to include work on an adjoining field of ten acres, acquired by the Essex County Council for immediate conversion into playing fields ; the discoveries here were no less important than those on Sheepen Farm. Digging had also to be undertaken on a Roman site across the Colne, and in the end much of the work on the line of the by-pass had to be held over for 1931.

The situation this spring has therefore been much more urgent in this regard than it was last year. By the time these words appear in print, the time-limit for excavation on the by-pass line will have expired.

The site of the Celtic city extends southwards from Sheepen Farm nearly to the Lexden Road, and on much of it building development is only a matter of time, now that the by-pass is under construction. Colchester, in fact, affords an extreme case of what has become a truism in the past ten years, that ancient sites on the outskirts of expanding modern towns cannot be considered safe until they are excavated. ' Development ' is bound sooner or later to come, and the Committee cannot afford to wait until it becomes a matter of weeks.

A beginning must be made during the rest of this summer with further exploration, and it has been arranged that Mr Christopher Hawkes, of the British Museum, shall undertake this work, under Mr J. P. Bushe-Fox, F.S.A., as general Director.

The intensive and systematic work which is called for requires a full measure of financial support. The liberality in response to its appeal that has already been shown in many quarters is a great encouragement to the Committee, but it is bound still to ask for £1000 at least, if its programme is to be at all adequately carried out. Subscriptions will be gladly received by the Hon. Treasurers, Colchester Excavation Committee, Barclays Bank, High Street, Colchester.

Last year we printed (September 1930, p. 362) *particulars of the work begun at Colchester, with a plan of the site, and again we cordially support the appeal for funds, the need of which is most urgent.*—EDITOR.

PLATE I

FIG. 1. IMPORTED AND NATIVE POTTERY OF THE EARLY 1ST CENTURY A.D.
COLCHESTER BY-PASS SITE, 1930

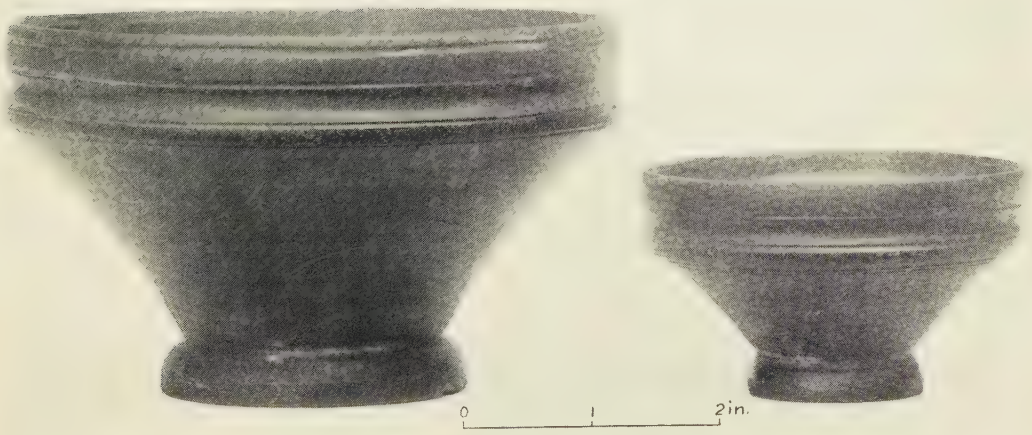


FIG. 2. TWO CUPS OF ARRETINE WARE BY THE POTTERS ATEIUS AND XANTHUS
COLCHESTER BY-PASS SITE, 1930

facing p. 240

FIG. 1. GROUP OF NATIVE AND IMPORTED BELGIC POTTERY OF THE EARLY 1ST CENTURY A.D.
COLCHESTER PLAYING-FIELD SITE, 1930

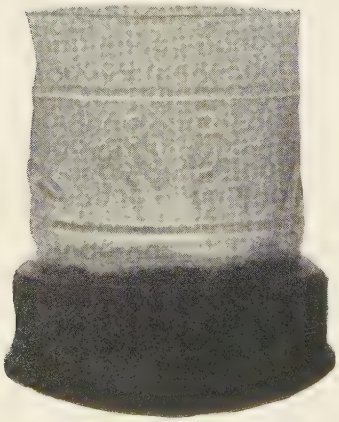


FIG. 2
MOULDED GLASS CUP (RESTORED), SHOWING FIGHTING GLADIATORS IN RELIEF WITH THEIR NAMES INSCRIBED ABOVE: PROBABLY GALLIC WORK, LATER 1ST CENTURY A.D.

FIG. 3
BRONZE TERRET OF LATE CELTIC TYPE

COLCHESTER PLAYING-FIELD SITE, 1930

Recent Events

The Editor is not always able to verify information taken from the daily press and other sources and cannot therefore assume responsibility for it.

The air-photographs of Hadrian's Wall taken by the R.A.F. have turned out unusually well. One of Housesteads fort (Borcovicium) was published in *The Times* (12 March, p. 16) and the *Illustrated London News* (21 March, p. 463). Long before they were taken we obtained a promise from Mr Percy Hedley to write a description of the remarkable lynchets there, but until an air-photograph was obtained, the site could not be properly investigated. We shall publish the account as soon as possible.

The success of these photographs is due entirely to their having been taken under the right conditions of lighting, with long winter shadows revealing the banks and terraces.

Professor Garstang announces the discovery of the cemetery of Jericho, belonging to the 19th century B.C. 'It is one of the richest finds ever made in Palestine, and is already yielding more data than we ever dreamed of. There are over a hundred tombs absolutely intact, and the prospect is unlimited. The first to be opened gave up many complete vases'. We are delighted to hear this news, and congratulate the Professor and Sir Charles Marston on their good fortune. (*Daily Telegraph*, 20 March).

An interview (by the *Johannesburg Star*) with Professor R. A. Dart, the discoverer of the Taungs skull, states that he is of opinion, as the result of his experiences, that the anthropology of the rest of the world will never be satisfactorily understood until Africa has been explored to a far greater extent. He considers it is of the utmost importance to give attention to the terraces along the Congo, for they are probably filled with fossilized remains of animals and, possibly, of man. (*The Times*, 8 April, p. 13).

Further examination is to be made of the Wady-el-Mughara (Valley of the Cave) at the foot of Mount Carmel by Miss Dorothy Garrod, together with Dr P. van Heerden and Mr F. Turville-Petre. An account of the earlier excavations on the site is given in *The Times*, 7 April, p. 13.

Excavations have been continued at Chester by Professor R. Newstead which reveal further evidence as to the position of the Roman amphitheatre. A section of the arena wall has been found which is an important factor in connexion with the rest of the theatre. (*The Times*, 6 April, p. 13).

An interesting exhibition was arranged recently at the Wellcome Historical Medical Museum, Wigmore Street, London, to illustrate the prehistoric operation of trephining the skull. It was organized by Dr Wilson Parry, who for many years has made a particular study of this branch of surgery. As the result of his observations he comes to the conclusion that in prehistoric days four different methods were employed in the operation. (*Morning Post*, 4 April).

A short synopsis of a paper read by Dr George A. Reisner in Cairo summarizing some of the results of his excavations in the Giza Pyramid area, undertaken for the joint expedition of Harvard University and the Boston Museum of Fine Arts, is printed in *The Times*, 31 January, p. 13. Dr Reisner gives particulars of funeral customs and contracts of the time of the 4th and 5th dynasties for services to be rendered after death.

The suggestion of a late survival of the Mycenaean type of tomb in Thrace is put forward by Professor Filov, of Sofia University, in an account which he has given of tombs found near Mezek and Kourtolin, on the Turkish frontier. They are of stone, and of the cupola type, built on the same principle as the ' beehive ' and ' tholos ' tombs, and are considered to belong to the 4th century B.C. (*Manchester Guardian*, 6 March).

A double-axe of stone, perforated through the centre and decorated with fine radiating grooves, has been found at Curraboy Knox, co. Mayo. (*The Times*, 5 February, p. 14).

An exhibition has been held at the Victoria and Albert Museum illustrating the eighth-century mosaics found at Damascus by the Institut Français. An account of these interesting decorations was sent to us by M. Contenau and printed, with illustrations, in ANTIQUITY, March 1930, pp. 105–8.

The eastern wall of the Roman fort at Richborough Castle has been cleared of the earth which has covered it for so long, and one section appears to have formed part of a guard room, or chamber used for some other purpose. (*The Times*, 14 April, p. 17).

A Roman villa at Southwick, near Portslade, Sussex, has been excavated by Mr S. E. Winbolt. (*The Times*, 26 March, p. 16; 13 April, p. 15).

The Colchester Excavation Committee began the new season's work on the site of Celtic Colchester in April. The Committee make an appeal for further funds towards the very considerable expense of this most important piece of archaeological investigation. (See p. 239).

The extraordinary activities of a society in Peking, known as 'The Society for the Preservation of Ancient Relics', which gives 'cultural objects' its particular attention, are reported in *The Times*, 30 March, p. 11. The Society was formed in 1928 and evidently intends to cover a wide field of action, for its 'cultural objects' extend from works of art to fossil remains dating millions of years before Man appeared. Among those who have experienced the interference of the Society are the Expedition of the American Museum of Natural History, under the direction of Dr Roy Chapman Andrews, Dr Sven Hedin, Sir Aurel Stein, and, as we mention below, the Haardt Expedition. Much annoyance and loss of time must have been caused to all by this quite futile obstructionism.

In speaking of plans for the further excavation of Knossos Sir Arthur Evans states that a wholly new class of 'creamy bordered' ware has been found, illustrating the finest age of Middle Minoan polychrome. Another interesting discovery was a room of a private

house which contained the remains of about 40 vessels and other objects devoted to a domestic form of snake-cult. (*The Times*, 30 March, p. 11).

A letter from Mr George A. Macmillan, Chairman of the British School at Athens, drawing attention to the work of the Expedition on the site of the temple of Hera Akraria at Perachora, and the great importance of the finds of last year, is printed in *The Times*, 26 March, p. 10.

An outline of the programme of exploration arranged by the French Expedition which is to cross Asia from west to east under the leadership of M. G-M Haardt, is given in *The Times*, 16 March, p. 11. The Expedition has the official support of the French Government and is undertaking certain research for various societies in France and ethnological museums in Paris. An important part of the programme is the investigation of the Chinese provinces from an archaeological point of view and we regret to see (*The Times*, 15 April, p. 13) that the Expedition has been held up at Nanking through trivial objections raised by the Chinese ' Society for the Preservation of Ancient Relics ', whose vexatious interference with scientific work has been mentioned.

Preliminary reports of the work of the joint Expedition of the British Museum and the Museum of the University of Pennsylvania at Ur have been communicated to *The Times* by Mr C. Leonard Woolley (6 February, p. 15; 20 March, p. 13; 10 April, p. 11). The great tomb-building of the Kings of the third dynasty, the discovery of which had already been made known, has been cleared. A chapel was found dedicated, as an inscription on a votive mace-head shows, to a little known deity Pa-sag, the ' protector of desert paths '. Later in the season attention was given to the residential quarter and there are now over 20 private houses, besides chapels, shops, and warehouses which ' give a consistent picture of Ur in the Abrahamic age '. A number of tablets have been found which concern business transactions, and in another instance they indicate the house of a priest who was also a schoolmaster. There are some 150 school exercise tablets and mathematical texts which will reveal the methods of a Sumerian school of the period 2000–1900 B.C.

An account of the Sturge Collection of flint implements in the British Museum, which numbers some 180,000 specimens, is given in *The Times*, 21 April, p. 11.

Writing in DISCOVERY (February 1931, p. 45) Mr C. J. Gadd, of the British Museum, says of the Ras Shamra tablets* :—

'These tablets, indeed, tell us nothing of the origin of the Phoenician alphabet itself, for their characters have no likeness to the Phoenician characters, and it would be very rash to say that they create any presumption that the Phoenician letters were made out of cuneiform. What they do suggest is that in the thirteenth century B.C. the alphabet was already known (as Ahiram's coffin had indicated) probably in very much the same form as it is found on that coffin, which does not in fact differ very widely from that of the Moabite Stone.

'The Ras Shamra alphabet is most probably the invention of a scribe schooled in the Babylonian cuneiform, alive to the convenience of the alphabetic method, but unwilling to give up his clay tablet and stilus, which, nevertheless, he finds very ill-adapted to the linear shapes of the Phoenician characters, and thus he devises wedge-combinations of his own for the same purpose. So much for his convenience and his contribution ; but we have still to continue the search for the origin, perhaps the genius, which produced, not so much the Phoenician letters, but the idea of the alphabet'.

The annual report of the Federated Malay States Museums Department contains details of an interesting presentation made to the Perak Museum. It comprises objects of the Stone and Iron Ages and two jars of later date. Among the specimens are stone bark-cloth beaters, axe-heads of ordinary types, some very fine quoit-discs, part of a stone bracelet, and a shouldered axe. The discovery of the last mentioned object—if carried, as Heine-Geldern maintains, by the Austroasiatics—proves the presence of the Austroasiatic culture in the Malay Peninsula. The Iron Age tools are mostly of socketed types, and part of a bracelet of translucent blue glass is probably also to be ascribed to that period.

*See F. A. Schaeffer, 'The French Excavations at Minet el Beida and Ras Shamra', ANTIQUITY, December 1930, p. 464.

In *Germania* for January last, the late Dr Drexel published an article on the pre-Roman origins of the Romano-Celtic temple. He connects them with four-sided enclosures of the La Tène period called, from their shape, Viereckschänze, and these again with TEMPLUM in its old Roman augural sense of a ritual Τέμενος. Thus the Roman augur corresponds with the Celtic druid. But, as Mr Christopher Hawkes has pointed out to us, the Viereckschänze are just the same kind of enclosures as our ' late Bronze Age camps ', typified by South Lodge Camp in Cranborne Chace. Were these temples ? We doubt it, but the suggestion is at any rate well worth examining.

The Bosanquet and Garstang Collections of Aegean and Hittite material respectively, are again on view in the Liverpool Museum, after being in store for some years. They have been catalogued and re-arranged by Miss D. M. Vaughan, and a full card-index is available for reference by students. The Aegean material includes many reproductions of well-known objects from Knossos and Mycenae, as well as pottery and other original objects, mainly from Professor Bosanquet's excavations at Palaikastro (described in *B.S.A.*, VIII–XI). The Garstang Collection comprises material from the excavations at Meroe (*Liv. Ann.*, 1910–14), in addition to the casts of sculptures from Hittite sites and the Hittite small objects. These latter include the inscribed stone from Aintab, (*Liv. Ann.*, I, p. 8, pls. IX and X, and *Hittite Empire*, pp. 312–13), tomb-groups from the cemeteries at Deve Huyuk (Woolley in *Liv. Ann.*, VI and VII) and a series of vases restored from fragments found in the stratified mound of Jobba Eyuk at Sakje-Geuzi. (The collection of sherds from that site, referred to in Frankfort, *Studies in Early Pottery*, II, 154, n. 2, remains at the Institute of Archaeology). The same gallery contains a type-series of Cypriote pottery of the Bronze and Iron Ages, selected from the Museum's stores, and a group of Cypriote sculptures from the same source.

Some Recent Articles

This list is not exhaustive but may be found convenient as a record of papers on subjects which are within the scope of ANTIQUITY. *Books are occasionally included.*

Neue Ergebnisse der neolithischen Forschung im südwest polnischen Lössgebiet, by Jozef Zurowski. *Praehistorische Zeitschrift*, 1930, XXI, 3–20.

Über die Herkunft der Hallstattkultur der Schwäbischen Alb, by Georg Kraft. *Praehistorische Zeitschrift*, 1930, XXI, 21–75.

Die Einbaume im Federseeried und im übrigen Europa, by Oscar Paret. *Praehistorische Zeitschrift*, 1930, XXI, 76–116. An exhaustive account, with lists, of dug-out canoes.

On a causeway at the prehistoric settlement of Southchurch, Essex, by A. G. Francis. *Trans. Southend-on-Sea Antiquarian Society*, 1930, II, 1.

An admirable account marred by complete absence of plans and illustrations. The author is not responsible for this grave omission which renders the paper almost unintelligible. It is thought that a pile-dwelling lies at the end of the causeway, and it would be highly desirable to determine this by further excavation.

Donation Edouard Bernays, by the Baron de Loë. *Bull. des Musées royaux d'Art et d'Histoire*, Bruxelles, ser. 3, no. 1 (Jan. 1931), 2–9, illustrated.

Describes some of the more important prehistoric objects presented by M. Bernays, many of them being from the dredgings of the Scheldt (Escaut) at Wichelen and Schoonaerde. The collection, though the property of the state, is not yet on permanent exhibition.

Journal of a Somerset Rector—John Skinner, A.M., Antiquary, 1772–1839 : parochial affairs of the parish of Camerton [Somerset], 1822–1832. Brit. Mus. MSS. nos. 33673–33728. Edited by Howard Coombs and the Rev. Arthur N. Bax. (London, John Murray, 1930). pp. 330, 5 illus. 15*s*.

This is a most disappointing book. John Skinner was no Parson Woodford, but a neurotic antiquary who shot himself after a lifetime of indiscriminate digging and scribbling. His note-books, one hundred volumes of them, contain, however,

the only existing records of much that has vanished ; and a selection from them would have been of great value. It is unfair to his memory to say, as do the editors in the preface, that these notes are ' mostly dead stuff ', though that description applies to some of those now published. To redress the balance, a selection from the archaeological notes is required. Will not someone undertake it ?

The ' Sea-land ' in Babylonian and Assyrian literature, by R. P. Dougherty. *Journ. Amer. Or. Soc.*, 1930, 1–25.

Identifies the ' Sea-land ' with Arabia.

The date of Cissbury Camp, by E. Cecil Curwen. *Antiquaries' Journal*, 1931, XI, 14–36.

An account of Cissbury and of Dr Curwen's excavations there in 1930, lavishly illustrated. Dr Curwen has proved that the camp ' was originally constructed in the La Tène I period (*circa* 400–250 B.C.), or possibly slightly later '. The article covers more ground than the title suggests.

Romano–British Wiltshire: being a list of sites occupied during the Roman period, with the addition of some pre-Roman villages ; by Mrs M. E. Cunnington. *Wilts Arch. Mag.* (Devizes) December 1930, XLV, 166–216.

This descriptive list must be the foundation of all future studies of native life in Wessex both immediately before and during the Roman occupation. It will be constantly referred to by all students, who are under a lasting debt of gratitude to the compiler. In publishing this list, the Wiltshire Archaeological Society is merely continuing its admirable policy of codification, of which Canon Goddard's lists (vols. 37 and 38), and Mrs Cunnington's previous schedules of long barrows (vol. 38) and beakers (vol. 43) are the most familiar and outstanding examples. A schedule of pagan Saxon cemeteries and chance finds would be a welcome addition.

Der Bayerische Vorgeschichtsfreund, heft IX, 1930. Annual subscription 4 marks, single numbers 2 marks. (J. F. Lehmanns Verlag, München 2 SW.).

This is a publication which it is well worth while to keep up with. It was founded in 1921 by the late Herr Johann Kändler, whose obituary appears in the present number, and is under the direction of Dr F. Wagner ; it deals with the prehistory and early history of Bavaria more particularly, but will be found to take account of all the latest tendencies in European, especially Central European, archaeology. The articles in this number are all by Paul Reinecke, and deal respectively with the topographical limits of early habitation in Bavaria, with the late Neolithic Bell-beaker culture, and with Celtic hill-forts. In all these regional survey and field-work play an important part, and the more we have of this sort of work from the Continent, the nearer we shall get to really reliable correlations throughout archaeology. It is interesting to note Dr Reinecke's support of the southwest European origin of beakers (p. 17), and to trace the close correspondence in type and distribution between

our own Celtic hill-forts and those in Bavaria and S. Germany generally, of which an annotated list is here given. The review of Bavarian field work and excavation for the year is a feature found in too few Continental publications, and along with the excellent notices of new books is just what one wants in England for keeping in touch with German work.

Good Roman type is used throughout : how long will it be before the few last strongholds of Gothic letter in Germany give over ? If the formidable *Mannus* yielded, the rest would surely follow. C.F.C.H.

Tartessos, by Adolf Schulten. *Klio*, 1928, XXII, pp. 284–291.

Summarizes the history of Tartessos from its colonization by an Ionian Greek —*essos* people down to the time of Strabo. R.A.

Die Etrusker in Spanien, by Adolf Schulten. *Klio*, 1930, XXIII; also separately, Dieterich'sche Verlagsbuchhandlung. Leipzig, 1930, 68 pp. with map.

Breaks new ground. The first Asia Minor colonists of Tartessos are now suggested to be a Tyrrhenian people diverging at Cape Bon from the main stream of Tyrrhenian migrations. The hypothetical name *turte* for their country would explain the Iberian form *turta* preserved in Cato and in various compounds. Another hypothetical form *tartasi*, in which the name may have been carried to the east by Carian Greek seamen, would account for the better-known Ionian Greek and Phoenician forms, Tartessos, and Tarshish. The trails of Tyrrhenian place-names are followed round the coasts of the Iberian peninsula, and an attempt is made to reconcile their frequency in Catalonia with the text of the 'Ora Maritima'. R.A.

A Description of the High Stream of Arundel, the heads and risings thereof ; the sundry kinds of fishes therein in their several haunts ; the swans and eyries ; the water bailiff . . . Being the titles of a manuscript written by, or for, the water bailiff of Thomas Howard, 24th Earl of Arundel, about the year 1637, and preserved in the Muniment Room at old Norfolk House, 31*a* St. James's Square, S.W. Edited with introduction, notes, map and index by Joseph Fowler, M.A. *Sold at the Museum, Littlehampton.*

A quaint and delightful book of more than local interest to the lover of rivers, fish and old customs; and edited with more than local knowledge. Would there were more such ! J.P.W-F.

Reviews

ROCK PAINTINGS OF SOUTHERN ANDALUSIA : a Description of a Neolithic and Copper Age Art Group. *By the* Abbé Henri Breuil *and* M. C. Burkitt, *with th collaboration of* Sir Montagu Pollock, bart. *Oxford : Clarendon Press*, 1929. *pp.* xii, 88, *with* 33 *plates and* 7 *maps.* 63*s.*

The Clarendon Press is to be congratulated on the fine volume now added to the rapidly increasing number of works on Palaeolithic art which have been published during recent years, chiefly in France. Encouraged by the generous gift of two coloured plates by the Marquis of Bute, and aided by a grant from the Fund for Promoting the Study of Organic and Social Evolution, which was presented by Prof. J. M. Baldwin through Prof. Poulton to the University of Oxford, the Press has produced a sumptuous monograph which will remain a classic in its subject. It describes the latest of the prehistoric paintings in the rock-shelters of southern Spain, which show the eventual degeneration of the naturalistic art of Palaeolithic man into small conventional figures and symbols. These paintings seem to have been made during a long period, some doubtless by Palaeolithic man himself, but most of them by the succeeding Neolithic man, and a few perhaps by the man of the Copper Age. They have been found most widely spread in Andalusia, but they also occur with the typical Palaeolithic art in eastern Spain, where they are often seen to be superposed on the naturalistic figures.

The first observations on which the work is based were made before 1912 by the late Colonel Willoughby Verner, who pointed out the paintings to the Abbé Breuil. At the end of 1913 the Abbé, accompanied by Mr Miles Burkitt, made some further explorations, and in subsequent years he devoted three seasons to the task of tracing the more important figures and making notes on them. Sir Montagu Pollock has translated and edited the Abbé Breuil's notes for publication with a large selection of his original drawings. Mr Miles Burkitt has assisted in the editing and provided some of the photographs, and he has completed the volume by adding some valuable introductory remarks and general conclusions.

The paintings under discussion are usually only a few centimetres in diameter, and have been made with the red, brown, yellow, and orange oxides and carbonate of iron, probably mixed with some kind of fat which has disappeared. When well preserved, they are so numerous and conspicuous that they are well known to the local peasants, who ascribe them to the Moors. The human figure is especially common, and the females are often represented with a petticoat and head-dress. A form of deer with many-tined antlers is the abundant quadruped, and birds are remarkably numerous.

The Abbé Breuil's detailed descriptions and illustrations begin with the shelter or cave of Las Figuras, in the southwest of the Sierra Momia, in which there are more than five hundred separate paintings, not grouped into scenes. Every noteworthy figure in each of many shelters is mentioned and explained, sometimes with a photograph as well as the Abbé's drawing. There are also many beautiful photographs of the shelters themselves and the country in which they are situated.

A most useful supplement to the Abbé Breuil's technical descriptions is contributed by Sir Montagu Pollock, who has collected and placed in series several groups of figures of men and deer to show the possible gradual evolution of various symbols. In one series the figure of a man passes into something like the Greek Φ, in others to a cross, a T, or even a star. A squatting human figure becomes a zig-zag, and a figure with multiplied arms (like an Indian deity) eventually looks as if it might represent a tree. A deer, by the loss of the head and neck and the multiplication of the legs, passes into something like a comb: when only two legs and the body remain, it produces the Greek Π. The beginning of symbolism is indeed most evident.

In his general conclusions, Mr Burkitt admits that some of the earlier conventional figures may be compared with the markings on the well-known Azilian painted pebbles. Most of the figures, however, must be later, either Neolithic or even of the Copper Age, which began earlier in Spain than in countries further north. Mr Burkitt points out that the conventional drawings of deer and the hour-glass type of conventionalized human figure which are found on the walls of the rock-shelters, are closely similar to those in the ornament of several examples of Copper Age pottery which are known from Spain. He also compares the conventional figures with those found in certain megalithic tombs, and mentions that two groups of such tombs, undoubtedly of the Copper Age, occur close to some of the chief rock-shelters described. The connexion with megalithic monuments suggests even wider comparisons, but much more research is needed before any satisfactory result can be obtained. A. S. WOODWARD.

CATALOGUE OF THE ROMAN POTTERY IN THE COLCHESTER AND ESSEX MUSEUM. *By* THOMAS MAY, F.S.A. *Cambridge: printed at the University Press on behalf of the Colchester Corporation*, 1930. *pp.* XII, 304 *and* 93 *plates*. 63*s*.

The enterprise and enlightened spirit shown by the Colchester Corporation and its Museum Committee in publishing this massive volume deserves widespread appreciation: it has rendered accessible a considerable part of a great and important collection of material from a really outstanding site. Further, the entrusting of the work to Mr May has enabled him to consummate the labours of a long lifetime in the study and publication of Roman pottery, not the least fruit of which is the general acceptance in this country of the high standard of profile and sectional drawing set by his experienced pen.

By way of introduction he has not found it necessary to go again over the ground he covered in his Silchester catalogue of 1916, and we have what is in effect a series of notes that may be regarded as an appendix to his introductory treatise there. Perhaps agreement will never be reached on the best name for 'Samian': a more momentous question is that of its imitation in native coarse wares. That this did not begin until after the cessation of the Continental Sigillata industry in the 3rd century is the thesis advanced by Mr May here, and recently also elsewhere, but while memories of 'Samian' forms certainly survived among the later provincial potters, as in the New Forest, at Castor, and at Colchester itself, contemporary imitations in good early coarse fabric deserve a wider recognition than they here receive, not least as a document for 'Romanization'.

Another matter of importance is the extension and intension of the term 'Belgic' as applied to pottery. The *Belgische Gefässe* of German archaeologists are properly speaking the products of the early Romanized industry of Belgic Gaul, most notable for its cups and platters in *terra rubra* and *terra nigra* imitating Arretine and early South

Gaulish prototypes. However, now that the pre-Roman immigrants into Britain who produced the Swarling-Aylesford series of pedestal-urns and other La Tène III vessels have been recognized as Belgic in origin, the expression ' Belgic ware ' is in danger of leading to confusion, especially at Colchester where the pedestal-urn people imported masses of the Romanized *Belgische Gefässe* from northern Gaul in the century between its conquest by Caesar and that of Britain under Claudius. For the moment, however, Mr May groups the two classes together, and the collection fairly represents both, though no. 6 on pl. I would seem, at least from its description (p. 12), to be a medieval jar.

A long series of decorated Sigillata ensues, not however covering the whole wealth of the museum, which is illustrated by photographs of the originals and of rubbings, many of them almost as clear as line drawings would have been. Mr May's penmanship is seen at its best in his drawings of plain Sigillata forms, and of the coarse wares that follow, though pl. LIX (lids) lacks a scale, and pl. LXIX (amphorae) combines with the drawings of fragments photographs of whole vessels on a different and unspecified scale.

The subsequent section on grave-groups has not been illustrated by the author, but by a series of photographs of varying quality, many of which also have no scale. However, it must be confessed that the quality of the grave-groups themselves varies somewhat : while many of the associations of vessels they comprise are true enough to period, others are too gravely inconsistent for explanation by assumed 'survival', and prompt the student to an attitude of strict caution. Early voluted lamps (*e.g.*, nos. 88, 102*a*) and bag-shaped roughcast beakers (18, 103), for instance, appear in embarrassingly late company, and Mr May has here restricted himself to severe brevity in his descriptions.

For the most part, however, those descriptions embody lucidity and erudition together, and though his list of potters' stamps is liable to deceive unwary students over the dating, which is habitually tied down with a misleading appearance of rigidity to the years of the accession and death of emperors, it gains in part at least from illustration in facsimile (text-figure 6).

Much material still remains to be dealt with at Colchester, but Mr May must be congratulated on his completion of the arduous task set him in the plan of this volume : those at least who are prepared to pay its price should be willing to apply themselves as carefully to its contents as they emphatically deserve. CHRISTOPHER HAWKES.

ENGLISH ROMANESQUE ARCHITECTURE. *By* A. W. CLAPHAM. *Oxford : Clarendon Press*, 1930. *pp.* 168, 65 *plates, and* 52 *figs.* 30*s.*

Mr Clapham's book will be welcomed not only by the serious student of pre-Conquest art in England, but also by everyone who takes an intelligent interest in our early civilization, for the author combines sound scholarship with an unusual power of clear exposition, and he has been careful, in producing this volume, to provide a full series of plans and illustrations which could hardly be surpassed for quality.

As Mr Clapham tells us in his preface, his object has been to present a general view of the major arts in England from the coming of St. Augustine to the Conquest, treating the work of the earlier and later Saxon periods as definite manifestations of artistic conceptions in which architecture and sculpture contributed to a common end. In this aim he has certainly succeeded, for every previous writer, with the exception of Professor Baldwin Brown, has confined his attention to one side of the subject.

After a short introduction, giving an outline of our present knowledge of the earliest

Christian churches, and of the oldest examples known to exist in Gaul and Britain, we have a very clear and adequate account of those 7th century churches of which there are actual remains, or literary notices which tell us something about the fabric. This is followed by a chapter on the stone crosses and sculptured ornament of the pre-Danish period, an admirable summary of what is known about this important subject, which supplements, and at times criticizes, the standard works of Brøndsted, Baldwin Brown and Collingwood. In this survey, the curious carvings at Breedon on the Hill, whose importance Mr Clapham himself was the first to recognize, are of course included.

The second part of the book treats of the post-Danish period, a subject admittedly obscure and difficult. Mr Clapham accepts generally Professor Baldwin Brown's conclusions as to the dates to be assigned to various buildings. Britford, however, he believes to have been built *c.* 800, on account of the well known vine scroll carving, and in this probably most students will agree with him.

Much attention has been given to the question of the sources from which Saxon craftsmen drew their inspiration, a highly controversial subject. It is to be hoped that healthy discussion will be the result. In support of the suggestion that the craftsmen to whom we owe the earliest Anglian crosses may have come from the Enarchate, it might be pointed out that whether the Ravenna throne be Alexandrine work or not, there are two sarcophagi in the church at Classe which bear vine scrolls of exactly similar type, that the full length figures in front of the throne may well have inspired the craftsman who carved the figures on the Ruthwell cross—note the veiled hand holding the book, the Greek form of blessing, the arrangement of the drapery, and the general attitude—and that, although the three-strand cord is almost universal in Rome, yet in Ravenna a two-fold strand is common. The single cord more generally found in English work is no doubt due to the coarser quality of the stone employed.

The suggestion that later Saxon architecture is an offshoot from the parent Carolingian stem may perhaps be accepted, provided that the source of all Carolingian architecture in northern Italy be remembered. Mr Clapham gives a somewhat grudging assent to Professor Baldwin Brown's theory that the essential features of later Saxon architecture are of German inspiration. This is by no means clear. My own view is, that the source is to be found in Italy. I can see no evidence to suggest that foreign craftsmen worked upon any extant late Saxon church, and such influence from abroad as we are able to trace points rather to the attempts of local masons to reproduce, from somewhat vague descriptions, the wonderful things which some priest or wealthy layman has seen when on pilgrimage to Rome. Thus the pilaster strip, as used at Earl's Barton, may well be derived from such a church as Toscanella, which must have been known to many a Saxon pilgrim.

Mr Clapham, then, has produced a book which is not only authoritative in its presentation of facts, but is also most stimulating, and must be provocative of further research. Every student will look forward to the appearance of his next volume, and some of us may even wish that this one had been longer. E. W. Lovegrove.

ST. CATHARINE'S HILL, WINCHESTER. *By* C. F. C. Hawkes, J. N. L. Myres, *and* C. G. Stevens. *Winchester : Warren & Son, the Wykeham Press*, 1930. *pp.* 310 *and numerous illustrations.* 12*s.* 6*d.*

It is in the fitness of things that three Old Wykehamists (though not very old ones) should have taken upon themselves the task of exploring ' Hills '. It is likewise in the

fitness of things that the task should have been well and truly done. This handsome volume is, in the first place, a new landmark in the long-neglected study of our hill-top ' camps '. In the second place, the reader who prefers Christians to Celts may find them in the second part of the book, which deals with the re-discovery of St. Catharine's chapel on the summit of the hill, and various matters relevant thereto. And yet again the faithful Wykehamist may turn, if he will, straightaway to ' Part Three : since the Reformation ', where he will find all that concerns the origin and early history of the connexion of Winchester College with the sacred hill. This is truly a book of parts, scholarly, well written, well illustrated (mainly by Mr Stevens and Mr Hawkes) and well printed. It is an essential book.

First, the ' camp '. The excavations revealed ' the existence of a settlement on the summit, open at first and then fortified by the girdle of earthwork, which lasted perhaps from the 6th to the 2nd century B.C., and thus covers the least known period of the Iron Age in this country '. The earthwork itself is thought not to be earlier than the latter part of La Tène I, say the 4th century B.C., on the evidence of the pot-sherds found in and under the bank. The dating of these small sherds is rightly, however, suggested without undue emphasis, and both they and other important pottery from the site may eventually have to be put back a little further in date. This question may be allowed to settle itself in the fullness of time ; the evidence of association is here clearly recorded, and any necessary adjustment in the absolute dating of the settlement can be made without difficulty.

Structurally, the outstanding feature of the ' camp ' is the solitary entrance which, on excavation, has revealed features without close parallel elsewhere. A special tribute must be paid here to the skill with which this delicate piece of excavation was carried out. The ends of the rampart were found to have been revetted with timber backed by clay, and towards their inner ends these revetments were set back to form shallow recesses or ' guardrooms '. Subsequently, the timber-work had been reinforced with chalk blocks, and part of the roadway had been blocked. This remarkable entrance has induced Mr Hawkes to add a valuable excursus on ' The development of Early Iron Age hill-forts and their entrances ', in which the latter are conveniently classified by type and date. St. Catharine's Hill provides the earliest dated example of the in-turned entrance in Britain, and the presence of ' guard-chambers ' here effectually disposes of the hitherto-plausible theory that this feature in certain later ' camps ' in Wales was of Roman derivation. But the main feature of the excursus is a reasoned statement of the rise and development of hill-fort construction in western Europe throughout the Early Iron Age. Mr Hawkes rightly emphasizes the hill-fort activity in the later Hallstatt and earlier La Tène periods, and so modifies views urged a dozen years ago (*e.g.*, by the present reviewer) wherein excessive stress was laid upon the important hill-fort phase of La Tène III.

The defences of St. Catharine's Hill were ' finally destroyed by a conquering enemy ', and the hill was not afterwards occupied until the Middle Ages. The disaster seems to have occurred in or before the middle of the 2nd century B.C. It is difficult, therefore, to equate the destroyers with the conquering Belgae, who, according to the present view, did not enter Wessex until at least a century after that date. It is, however, impossible to hope for a convincing equation between the destruction of an individual hill-fort and the few historical incidents which chance happens to have preserved for us. When in fact the Belgae did reach the district, they seem (if the slight evidence available is representative) to have settled approximately on the site of the Roman and medieval town.

Everywhere the semi-Teutonic Belgae in Britain seem to have been valley-dwellers rather than hill-folk.

In the 12th century a small cruciform chapel, with an attached lodging for the priest, stood upon the hill-top, and the history and archaeology of this structure are fully dealt with, largely by Mr Myres. The ' small finds ' are recorded with a welcome fullness unfortunately rare on medieval sites ; indeed it may be doubted whether any medieval building of commensurate size has ever been so meticulously described in all its aspects. The description concludes with a comprehensive note on the history of devotion to St. Catharine in medieval England.

Part three of the book is for the ear of the Wykehamist, and is no subject for a barbarian pen. Suffice to say that it is a pleasant and worthy epilogue to the story of a hill that, after bearing in turn a British town and medieval chapel, has become ' a Public School playing-ground that has been strangely beloved '. R. E. M. WHEELER.

THE MOUNT OF GOD. *By* The REV. W. J. PHYTHIAN-ADAMS. Palestine Exploration Fund Quarterly Statement, *July* 1930, *pp.* 135–49 ; *October* 1930, *pp.* 192–209, *and sketch-map.*

TRANSJORDAN : an ancient and a modern raid. *By* Group-Captain L. W. B. REES. The Royal Air Force Quarterly, *January* 1930, *vol.* I, *no.* 1, 138–159, *folding map in colours.*

We wish to draw attention to these papers because they deal with a subject—that of the Old Testament geography—once popular, then shelved, but now (if we mistake not) about to come to the front again. Both deal with the Exodus and wanderings of the Children of Israel, and both are written by students with firsthand knowledge of the country.

Mr Adams has a single objective upon which he trains his very efficient battery of argument ; he maintains that Horeb-Sinai was a volcano in the land of Midian, to be identified with Tadra or Hala el Bedr (the modern mountain also seems to have alternative names) lying between 27° and 27° 30′ north lat. and 37° and 37° 30′ east long. In favour of this identification he brings forward evidence both of a general character—such as the remote situation of Tadra, which is cut off from the Holy Land by a ' great and terrible wilderness ' ; and also of a more specific, archaeological kind—the reported existence there of twelve stones with religious associations, and of ' various signs and inscriptions . . . carved on sacrificial boulders '. (Musil, *The Northern Hegaz*,[1] p. 216). If we agree, as we probably shall, that the Mount of God was a volcano, we must look for it in one of two regions ; and Mr Adams rejects the lava-field of Ma'an, where volcanoes are also found, and where Group-Captain Rees locates it, because it is too near Palestine to satisfy the requirements of the biblical account. Both writers reject the modern ' Sinai ' peninsula, whose name lacks really ancient authority and where there are no volcanoes, and never were any.

It is not for us to decide between these alternatives. What is obviously required is for someone to go and make a thorough survey of those ancient remains round Tadra, which even Musil knew of by report only, and which no traveller has seen. (He might

[1] Reviewed in ANTIQUITY, II, 123.

also at the same time revisit that ' Stonehenge ' of Central Arabia described by Palgrave [2] and by no one else). The results might be inconclusive, but nevertheless they would certainly be of great archaeological value.

Group-Captain Rees has many targets, and he does not claim to score direct hits every time. What is important is the fact that he knows the lands of Midian, Edom and Moab as few men alive know it. He has explored it from the air and on the ground ; and that undoubtedly is the way to get the best idea of the topography of any region, particularly one consisting largely of wide, open spaces. His map contains information to be found nowhere else, and so does the text. He traces the wanderings of the tribes with sureness, but (if we may say so) without cocksureness. He draws a comparison—perhaps a little strained—between the Exodus and that other ' raid ' of Colonel Lawrence ; and he gives chapter and verse throughout. It is an honest and scientific attempt to solve one of the classic problems of history ; and it deserves to be considered by biblical scholars. We only wish it had been possible for one of them to do so in this review, which in default is written by an amateur hand.

BAHREIN. *By* Ernest Mackay. British School of Archaeology in Egypt, 1925. *Quaritch.* (Published in same volume with *Hemamieh*). *pp.* 29, *and* 8 *plates.*

The island of Bahrein lies in the Persian Gulf, some 20 miles from the Arabian coast. It has long been famous for its chambered gravel tumuli, which, to the almost incredible number of over 100,000 (we are assured by Mr Mackay) have long been one of the great enigmas of the past. That they still remain so to some extent is no fault of the excavators. Datable finds in that remote spot could hardly be expected. Finds of any kind were rare, partly on account of the salt in the soil, partly because the grave-goods were deliberately broken, or ' killed ', before interment. A date of 1500–1200 B.C. is suggested, though an earlier one is admitted to be possible.

The presence of so many tumuli on an almost desert island smaller than the Isle of Wight, and still smaller in the past, demands an explanation ; and it is suggested that it was used as a burial-ground by the inhabitants of the adjacent mainland of Arabia. The tombs are all oriented in that direction (southwestward) ; and such indications as are provided by the grave-goods point the same way. Ostrich eggshell, for instance, is abundant, and the pots, being round-bottomed, are more suited for the sandy soil of Arabia. They seem also to have been made from non-local clay. There is evidence in the Far West of the use of presumably sacred islands for burial, and apart from the necessity of some such hypothesis Bahrein cannot possibly have supported so large a population, nor are any archaeological remains of such, in the form of habitation-sites, known to exist on the island.

The tumuli are not without an interest of their own, but we cannot help feeling that the problem, such as it is, has been disposed of for the present generation at any rate by the work carried out by Mr Mackay for the British School of Archaeology in Egypt. Climatic and soil conditions combine to make Bahrein a bad place to excavate in ; and it is on the mainland that the final solution must now be sought.

---

[2] W. T. Palgrave, *Central and Eastern Arabia*, 2nd ed. 1865, I, 251–2. It lay near Eyoon (Ayun) in Lower Kasim, about midway between Hail and Riyadh. This is, of course, a long way —over 400 miles—from Tadra ; and both lie within the somewhat inaccessible kingdom of the Hejaz, ruled over by Ibn Saud.

ANTIGUO PERU : primera epoca. *By* JULIO C. TELLO. *Lima : La Comisión Organizadora del Segundo Congreso Sudamericano de Turismo*, 1929. *pp.* 183. *No price stated.*

Dr Tello modestly introduces his book as a ' tentative systemization of archaeological data bearing on the most remote epoch in Peruvian history '. Fortunately, however, the tentativeness is not greatly in evidence : Dr Tello intersperses and appends to his summary definite theories as to the origin and antiquity of the early cultures. His views are valuable, representing as they do those of an authority who still champions the ancient Andeans as the first civilized people in ancient Peru.

He divides the pre-Columbian cultures into three epochs, and the first, extending roughly from 500 B.C. to A.D. 400, is the subject of his book. Within this rather arbitrarily placed first epoch he distinguishes two phases : the Andean Megalithic, when the peoples of the Sierra were experimenting in building and agriculture, and the Archaic Littoral, when the inhabitants of the coast, drawing their inspiration from the Sierra, passed from the life of primitive fishers to that of town-dwelling traders and terrace-agriculturists.

After detailed description of the architectural remains of various Sierra sites, including Yayno and the mysterious Chawin, Dr Tello passes to consideration of middle settlements—Aija, Wari, and the like. The last part of the book is devoted to that apogee of the Littoral culture, Parakas, where the recently excavated necropolis has supplied examples of early Peruvian arts at their highest—from mummification to textile weaving.

Much disputed Tiawanako the author finds already settled in the first epoch, and that first epoch's culture generally extending northwards from thence to Changoyape. Rearing pyramids and temples, worshipping the jaguar and condor gods, the people of the Littoral appear for some seven or eight hundred years to have remained indifferent to, or unaware of, the use of metals—with the significant exception of gold, as Dr Tello notes.

The book is not only magnificently, but helpfully illustrated. The contents list at the beginning is, however, as usual with such Spanish works, aggravatingly innocent of page references. J. LESLIE MITCHELL.

GRAECIA ANTIQUA : maps and plans to illustrate ' Pausanias's Description of Greece ' ; *compiled by* SIR JAMES G. FRAZER, *with explanatory text by* A. W. VAN BUREN. *Macmillan*, 1930. *pp.* XII, 162. 35 *maps and plans.* 25*s.*

Pausanias was the Greek Camden ; but he far surpassed him as an intelligent observer, and in the range of his interests. Sir James Frazer's original commentary has been a classic for more than 35 years, and will remain so ; but it is in 6 volumes, costs 6 guineas, and is necessarily ill adapted for the traveller's portmanteau.

We therefore offer a most hearty welcome to this handy atlas, which all visitors to Greece must take with them. The scope is sufficiently indicated by the title, and the names associated with it are a guarantee of authority. The only criticisms we have to make are that the descriptions are not always as clear or as full as they might be, and that sometimes facts and inferences are not rigidly demarcated. The description of Mycenae is an instance. Here, as in the bibliographies, only work done since Sir James Frazer's original publication is taken into account. Consequently there is no mention of Schliemann. Nor is there any hint of the topographical importance of its position—as a stronghold on an important trade-route. Too much, we think, is taken for granted ; and essential facts are sometimes omitted. A portable atlas for travellers

should surely state facts like these, which, however well known and obvious to specialists, are likely to be unfamiliar to some at least of those for whom the book is intended.

The book is in fact, a supplement which takes for granted what has already been published in the original. Professor van Buren laments the necessity for compression, but many of the single pages to which he is necessarily confined contain blank spaces, amounting sometimes to as much as half a page. There would have been room for another 4,500 words altogether, or about 8 or 9 lines each, if we exclude those 20 of the 58 pages which are actually full. A little more of that rigid economy of words which is acquired in the hard school of journalism would have reduced some of the accounts yet further ; and the space thus made available might have been used in the way suggested.

It is easy, however, to pick holes, and it is perhaps somewhat ungracious to do so when we are presented with such a splendid gift as this. We repeat that it is indispensable for all travellers, be they specialists or not ; and after all, the more obvious facts can generally be found in Baedeker. The maps and plans are, with four exceptions, the same as those which accompanied the original, and they are, for the most part, a delight to study.

DEN NORSKE BOSETNINGEN PAA SHETLAND-ORKNÖYENE. Studier og resultater. *Av* A. W. Brögger. *Skrifter utgitt av det Norske Videnskaps-Akademi i Oslo.* II. *Hist.-Filos. Klasse*, 1930. No. 3. *Oslo : Jacob Dybwad*, 1930. *pp.* 290, *with* 151 *figs.* 22 *kroner.* (*English summary*).

Knowledge of the circumstances under which the Norse settlement of the northern and western isles of Scotland took place in the 8th and 9th centuries has not kept pace with knowledge of the contemporaneous Scandinavian settlement of England. The present volume marks the first notable step forward since the work of Joseph Anderson half a century ago. By brilliant work in field and laboratory Scandinavian archaeologists have gradually established among the innumerable relics discovered in those northern lands—certainly among those from the Christian era—a pretty accurate chronological sequence. Equipped with this knowledge, Professor Brögger has recently addressed himself to the study of Scandinavian remains in Scotland. Where earlier writers have only been able to label a relic as ' Norse ', he is able to tell not only the century (if not the decade) to which it belongs, but even the part of Norway with which its type is most closely identified.

To determine the date of the settlement from the date of the types of sporadic relics discovered is, of course, by itself a perilous adventure. For example, one of the famous 12th century runic inscriptions in Maeshowe records that it was cut with an axe which had belonged to Gauk Trandilsson, an historical personage who had lived in Iceland nearly 200 years earlier. But his axe was still extant and in use. Brögger is well aware of this danger, and in general is careful not to strain his premises. In that respect the present volume is much more cautious than his *Ancient Emigrants*, which partly covers the same ground.

In order that the conditions under which the settlement took place may be understood as fully as possible, the first part of the volume is devoted to a review of pre-Norse Orkney, etc. This very comprehensive review is the most competent and useful survey of that field which has so far appeared. He has no doubt that the Picts were a Celtic race, and the parallels he draws between the megalithic structures of Orkney and Brittany, and between the later brochs and the Celtic ' oppida ' described by Caesar, are both pertinent and pregnant.

The latter portion of the book, which is devoted mainly to a discussion of all the recorded early Norse remains in Scotland, is of the very highest value, for here Brögger speaks with unrivalled knowledge and authority. His review of the evidence from place-names is open to considerable criticism, but here, too, the meagre data at present available have been carefully weighed. From all the evidence at his disposal, his conclusions may be thus summarized. The colonization of Orkney and Shetland began before A.D. 800, and heathen burial customs ended there by 950 if not by 900. The settlement of the Hebrides began somewhat later—probably between 800 and 860 when the main settlement took place. On the Scottish mainland the southern limit of settlement was the Moray Firth, but even in Caithness the settlement was considerably later than in Orkney. It evidently took place in the 10th century, and appears to have been an emigration of farming folk from Orkney.

It was the west of Norway from which the settlers came, and mostly the southwest corner. There is no evidence of anything like an extirpation of the native Picts ; on the other hand they were apparently assimilated, a fact borne out by the frequent occurrence of Celtic names among Norse families in the Saga.

It is impossible in the space available here to do justice to this admirable volume. It does not profess to record any new discoveries ; it is merely an interpretation of all the facts and discoveries already recorded. But it is a rare example of how careful interpretation by a trained and exceptionally virile mind can push back the barriers of the unknown. For the benefit of readers without a knowledge of Norse, a brief but exceedingly useful English summary of 14 pages is appended. HUGH MARWICK.

MEDDELANDEN FRÅN LUNDS UNIVERSITETS HISTORISKA MUSEUM. *Edited by* O. RYDBECK. (K. Hum. Vetenskapssamfundets i Lund Arsberattelse IV, 1929–30). *pp.* 90, *illustrated. Price not stated.*

This publication contains an account by Professor O. Rydbeck, the Editor, of the safe removal from its original site of a complete grave of the ' Battle Axe Culture ' and of its transport to and setting up in the Lund Museum. The Professor's well-known views as to the survival of the Ertebölle Culture until almost the end of the Stone Age are supported by a paper on stone axes by M. Rydbeck and by J. E. Forsander's account of a really astonishing Stone Age dwelling-site. M. Rydbeck has also a paper on early Bronze Age brooches in Lund Museum, and, finally, F. Hansen describes the excavation of a partly ruined passage-grave that was found to be rich in pottery and amber. The papers are all in Swedish but German abstracts of them are printed in a short appendix. T. D. KENDRICK.

POMPEII IN THREE HOURS. *By* TATIANA WARSCHER. *Industria Tipografica Imperia, Rome*, 1930. 20 *lire.*

This interesting and well-illustrated volume will be useful, not merely to the ' hurried (one might almost say ' harried ') tourist ' of whom Baedeker so often speaks, but to the more leisurely visitor. For Madame Warscher knows her Pompeii well, and the excellent photographs from her extensive collection are not one of the least noteworthy features of the book. The text is clear and lucid, and the descriptions of the principal buildings already known, of eighteen selected houses, and of the new excavations, will be found extremely useful. T. ASHBY.

STUDI ETRUSCHI, vol. III. *Florence : Rinascimento del Libro*, 1929. *pp.* 603, *and* 61 *plates*. 80 *lire*.

The two preceding volumes of this interesting and important periodical have already been noticed in ANTIQUITY[1] and that which is at present before us does not in any way fall short of its predecessors. A number of the papers printed here *in extenso* had been read at the first international congress of Etruscan Studies, held in Florence in 1928, also noticed in ANTIQUITY[2], among them that of Prof. Bosch Gimpera on post-Mycenaean relations in the Mediterranean in connexion with the Etruscan problem ; of Prof. Taramelli on Sardinians and Etruscans ; of Prof. Sogliano on the oldest defensive enceintes of the cities of Etruria and of the rest of Italy (which he believes to have been wooden stockades) ; of Prof. Ciaceri on the influence of the civilization of Magna Graecia on Etruria in the 6th century B.C. ; of Dr Ashby on the Roman road system in Southern Etruria in relation to the Etruscan ; and of Prof. S. Ricci on Etruscan influence on the oldest coinage of Rome. The same remark applies to some of the papers in the linguistic and natural history sections, in the last of which physiography, anthropology, zoology, and metallurgy all find place. We then have short, but important sections on recent discoveries and discussions, publications and congresses, so that the whole volume is one which will repay attention. T. ASHBY.

LATIN HISTORICAL INSCRIPTIONS ILLUSTRATING THE HISTORY OF THE EARLY EMPIRE. *By* G. McN. RUSHFORTH. *Second edition. Oxford University Press*, 1930. *pp.* XXXII, 144. 8*s* 6*d*.

Mr Rushforth's well-known volume, published in 1893, has been out of print for several years, and has now been re-issued in a photographic facsimile—an admirable piece of work from the technical point of view—with various corrections and alterations, including references to Dessau and the British Museum Catalogue of Roman Imperial coins, and a dozen pages of corrigenda and addenda. Thus re-issued, the book will long continue to be what it has been in the past—the standard English introduction to the historical use of Latin inscriptions. R. G. COLLINGWOOD.

MYTHS OF THE ORIGIN OF FIRE : an essay. *By* SIR JAMES GEORGE FRAZER. *Macmillan*, 1930. *pp.* VII, 238. 12*s* 6*d*.

Measured with the giant's ruler this book may perhaps be called only an essay ; for the author of the *Golden Bough* (in 12 volumes) works on the grand scale. To the ordinary bookmaker it is a book, and a very useful one too. The arrangement is geographical ; myths attempting to account for the origin of fire have been collected from all over the world, and certain conclusions drawn. There was a time when fire was not known ; then came a period when it was used but could not be made ; finally it was both made and used. Lightning, flint-work and the friction of dry boughs in the wind may have been the first agencies to give man fire. It is probable that it was found independently more than once.

A companion volume on known prehistoric and early historic methods of producing fire, with distribution maps, would be very welcome.

---

[1] 1928, II, 250, 494. [2] 1928, II, 337 *sqq*.

ROYAL COMMISSION ON ANCIENT AND HISTORICAL MONUMENTS AND CONSTRUCTIONS OF SCOTLAND. 10TH REPORT. COUNTIES OF MIDLOTHIAN AND WEST LOTHIAN. *H.M. Stationery Office : Edinburgh*, 1929. *pp.* XLVIII, 260, *map and* 240 *figures.* 32*s* 6*d.*

This volume, as is to be expected, has not the attractive novelty of the Outer Hebrides report, but it is a worthy, even if less exciting, successor to its popular forerunner. On the whole the remains of prehistoric times in Midlothian and West Lothian are not of much account and it seems that the fortified settlements on Kaimes Hill and Craigie Hill are at present the early sites most likely to repay investigation ; but field monuments are not lacking, and an earth-house partly built of Roman masonry and the ruins of the solitary broch in this area are rightly esteemed as possessions of a high importance. The Roman period provides the authors with fuller material for discussion, so that the determination of the course of Dere Street, and examination of the claims of Edinburgh to rank as a Roman station, and a description of the Cramond fort and of the beautiful Bridgeness distance-slab fill the pages of an instructive section that boasts among its illustrations a handsome coloured plate of an enamelled patera (the page-reference to this [XXVII] should have been stated on the plate itself and also on p. XXXV). The Early Christian period is neglected in the Introduction (where the Gogar penannular brooch [fig. 9] ought surely to have been rescued from the Bronze Age), but the Inventory itself contains the lovely Carlowrie cross-shaft and also the Abercorn shaft, both most admirably illustrated ; the authors, however, do well in concentrating in their preliminary essay upon the architecture of later days, for this it is that constitutes the bulk of the book. They give us full measure of the elaborate descriptions and excellent plans and photographs that are now expected in these valuable volumes, and by adding a really useful glossary of architectural terms they materially increase the usefulness of this book for the layman who is wise enough to consult it when he visits—let us say—Linlithgow Castle or Roslin Chapel.

T. D. KENDRICK.

THE ROMAN CAMPAGNA AND ITS TREASURES. *By* GILBERT BAGNANI. *Methuen*, 1929. *pp.* XVI, 320, *with* 24 *plates and* 3 *maps.* 10*s* 6*d.*

This interesting and useful volume is intended largely for the motorist. The Campagna has, in the last few years, been entirely changed by the construction of a network of new crossroads, which join together the previously unconnected main roads and which are shown only upon the most recent maps. The change of the road system from the figure of a starfish, as it was some thirty years ago, to a spider's web,[1] as it was in Roman times, has thus been brought about, though these new roads, unlike the Roman *deverticula*, are by no means straight, and in most cases follow the bottom of a valley if and where they can. They are, therefore, not as useful to would-be explorers of the Campagna as they might be. It is, however, a pity that they are not marked in the maps, which are otherwise useful, on the front and back end-papers of the volume.

At the same time the transformation into motor roads of the old main highways of the Roman Campagna is proceeding apace. The Via Aurelia and a short section of the Via Salaria are the only roads that have preserved their old-world appearance in the immediate neighbourhood of the city. The Via Ostiensis, one of the most characteristic

[1] See *Papers of the British School at Rome*, I, 136 (published in 1902).

within my own recollection, has lost all traces of antiquity and has become a mere speedway. The Via Tiburtina and several other roads (which certainly needed it) have been widened, and a number of minor discoveries have been made in the cuttings which have been required. Cultivation continues to spread everywhere, and the Campagna, as Lanciani predicted, is fast losing that wonderful solitude which still renders it unique. Parts of it are fortunately still unchanged, and our author, who has a true feeling for its beauties (witness the remark on p. 254)[2] rightly indicates the district between the Via Appia and the sea as that which has undergone the least transformation. Much of the territory on the right bank of the Tiber is still unchanged, but this, which is in reality part of Etruria, is not dealt with by our author, for reasons which he explains in the preface. In his eminently readable description he works round from the seacoast to the Via Salaria and the Tiber, always following the main roads. He is concerned with the history and antiquities of all periods, and thus caters for readers of all classes, both learned and unlearned. The limits of the Campagna in the usual sense are considerably overstepped, for, as is only fitting when a motor is used, the traveller is taken as far afield as Terracina, Anagni and Subiaco. As all these are places of the greatest interest, one cannot but be grateful to him for the description of these towns, as well as for the pages which deal with Tivoli ; for few people penetrate to the lower town, with its interesting churches and houses. The walker is also considered, being carefully told where to leave the motor and where to get into it again. A few points of detail might, naturally, be criticized, especially where the aqueducts are in question. There are rather too many misprints ; and though the style is lively, such phrases as ' the Greeks of the Campania ' (p. 70), ' a lurid inn ' (p. 73), ' the bookshop Ruggeri ' (p. 113), ' so called from a family Monaci ' (p. 156), should be corrected in a second edition. But on the whole the book is distinctly useful and welcome, and the excellent illustrations are not the least of its merits. T. Ashby.

DER OSEBERGFUND. *By* F. Adama van Scheltema. *Führer zur Urgeschichte*, 7. Augsburg (B. Filser), 1929. *pp.* 79, *with* 28 *plates and* 31 *figures in the text.* 3*m* 50.

This excellent series of handbooks describing the most notable archaeological discoveries of Germany and the north has been conspicuously well served by its appointed authors, and Dr Van Scheltema, as is to be expected, has in his turn done full justice to the lovely Oseberg boat and her precious cargo of treasures. He describes the discovery with proper detail and adds to his account of the ship the necessary background of early Norwegian history ; but this he has considered to be only a part of his task and the book is completed by a solid chapter on Oseberg art and its origins, a subject upon which the author has already proved himself entitled to a respectful hearing. I regret only that this admirable essay was written before Halvdan Koht's new dating for Hafrsfjord began to gain ground, for I am not aware that any writer has yet attempted to consider the bearing of this small but important forward shift upon Queen Asa's dates and the Oseberg chronology. Setting aside the monumental many-volumed *Osebergfundet*, Dr Van Scheltema's book is now, of course, the best account of this most famous of all Viking ships ; English readers, however, must not forget the illustrated articles by Dr Brögger and Dr Shetelig in vol. x of the *Saga-Book* of the Viking Society. T. D. Kendrick.

[2] Unfortunately motors will soon be able to desecrate both the Sacro Speco and the Monte Autore.

GERMANIA ROMANA : ein Bilder-Atlas. *2nd edition. In ten parts. Bamberg : C. C. Buchners Verlag*, 1924–30. 208 *plates, with* 240 *pp. of text.* 16 *marks.*

The first edition of this admirable work appeared in 1922, just when the German currency had begun to drift rapidly towards the Niagara of inflation. As a result, it was sold out almost immediately, under conditions that must have been anything but profitable to the Römisch-Germanische Kommission, the body responsible for its issue. At the same time the copies failed to reach the public whose needs the Album had been designed to meet, for the catastrophic fall in the value of the mark was accompanied by a no less catastrophic decline in the purchasing power of professional students and scholars. It is greatly to the credit of the Kommission that one of the first tasks to be undertaken, after the monetary situation had been stabilized, should have been the preparation of a new and improved edition.

Originally it was a folio of 100 plates, preceded by 24 pages of introductory matter, which did not profess to do much more than supply titles for the individual illustrations. It now consists of ten parts, five of text and five of plates, in a smaller and more convenient *format*. The number of illustrations has been slightly increased, but the chief improvement is the amplification of the text. The five double-parts deal respectively with (1) military works (fortresses, forts, frontier-lines, baths, roads, etc.), (2) civil settlements, (3) tombstones, (4) religious dedications, and (5) pottery, tools, weapons, utensils, silver plate and the like. In all of these the regions of the Rhine, the Danube and the Moselle are extraordinarily rich, and it has been possible to make a representative selection that is as instructive as it is interesting. The book is one which no student of Roman Britain should be without. Even those who do not read German will often find the plates helpful, while those who do will learn much from the scholarly introductions, with their ample bibliographical references. There are, in all, about 900 illustrations, usually of excellent quality. At 16 shillings the price is extremely moderate.

GEORGE MACDONALD.

MACHU PICCHU : a Citadel of the Incas. *By* HIRAM BINGHAM. *Published for the National Geographic Society of America by the Yale University Press, New Haven, Connecticut*, 1930. *pp.* VII, 244, 218 *collotype illustrations and plan of town.* 50 *dollars.*

This volume, as monumentally priced as produced, contains the report of the ' explorations and excavations made in 1911, 1912, and 1915 under the auspices of Yale University and the National Geographic Society ' in and around the ancient site of Machu Picchu in the Central Andes. Until visited by Dr Bingham in 1911 Machu Picchu remained outside the knowledge of the modern world. It had no place on even the most careful Peruvian maps. Neither the *conquistadores* nor their successors ever appear to have located it, thereby doubtlessly saving themselves much vexation and disappointment, for it has yielded no atom of ' treasure ' in the popular sense, though much from the viewpoint of the Americanist.

Built on a ridge between two peaks, in the heart of a nearly inaccessible mountain-block, the temple and palace walls display the well-known characteristics of the ' cyclopean ' style of Tiawanako and early Cuzco. For unknown reasons Dr Bingham describes this style as ' typically Inca '. The ridge was terraced for agricultural purposes, elaborate guard-houses and signal-stations reared at various places surrounding the site, and what is probably the most magnificent *intihuatana* in Peru cut out of the solid rock.

Population grew ; a housing problem arose ; buildings encroached on the terraces . . . then, except for a few priests and caretakers, the site was deserted for several hundred years while Manko Kapak sallied forth with the surplus population, captured Cuzco, and reared the ' Empire of the Incas '.

This is Dr Bingham's theory, though the evidences of the ruins hardly seem to warrant any such whole-hearted acceptance of Montesino's account of Inca origins. He ascribes the second (true Inca) style of architecture superimposed upon the first to the hasty building operations of a band of Sun Virgins and their guardians, convoyed across the mountains for safety from Pizarro and his followers.

These somewhat bizarre speculations apart, the book is a valuable record of solid and painstaking work. The accounts and illustrations of the pottery and metallurgical remains discovered are admirable. The first contains few surprises, though several conventionally beautiful specimens ; laboratory tests on the second, however, seem to have established quite definitely that Peruvian bronze was no accidental mixing of copper and tin, but definite and skilled intention. It is hardly possible to over-estimate the importance of this discovery as regards the whole field of American archaeology.

The volume is magnificently illustrated—too magnificently in some instances, some of the photographs suffering from an ' arty ' toning which seriously detracts from their value.

J. Leslie Mitchell.

KUNST UND KULTUR DER VORZEIT EUROPAS. DAS PALÄOLITHIKUM. *By* Herbert Kühn. *Berlin and Leipzig : Walter de Gruyter & Co.* 1929. *pp.* 529, *with* 169 *text-figures*, 120 *black plates*, 6 *coloured plates*, *and* 8 *maps*.

Dr Herbert Kühn, the well-known prehistorian of Cologne, is preparing an exhaustive treatise on the art and ideas of prehistoric man in Europe, and has completed the first volume, which deals with the Palaeolithic period. It is an admirable historical summary of the subject, with full references; and it is especially valuable because the author himself has visited most of the localities in Europe and North Africa in which the discoveries were made, and has studied the various works of art to which he refers. His descriptions, indeed, are based on personal knowledge, and his own observations and comments are numerous and important. The accompanying illustrations comprise not only the usual text-figures, but also 120 plates of photographs, many representing objects of which photographs have not hitherto been published. There are in addition a few excellent coloured plates to show the various styles of rock-painting, and the volume concludes with a series of useful maps on which are marked the known localities of each phase of Palaeolithic art.

In a long introductory chapter Dr Kühn summarizes our present knowledge of the successive stages through which Palaeolithic man passed in western Europe, and discusses the circumstances under which each race lived. He considers that there is evidence of only two cold and two warmer episodes of the Glacial Epoch in the deposits in which undoubted stone implements are found. He describes the changes in the accompanying groups of mammals and plants. He also refers briefly to the few remains of Palaeolithic human skeletons which have been discovered, and emphasizes the fact that there are no traces of art earlier than the Aurignacian stage when typical modern man first appeared. From this time onwards to the end of the Palaeolithic period, three contemporary styles of art are distinguishable. The Franco-Cantabrian style spreads from Russia through central Europe to the Pyrenees and Cantabrian mountains. The

East Spanish style is represented in Spain south of the Pyrenees. The Capsian style characterizes northern Africa.

Most of the volume is, of course, devoted to the Franco-Cantabrian art, and Dr Kühn notes the remarkable fact that we already know no less than 175 stations in which examples of this art have been discovered. In some stations the number of the works of art ranges from one to three hundred, so that there is ample material for study. Even individuality can be recognized in the differences between the art of different caves and many unfinished and confused sketches, especially on pieces of stone and bone, suggest preliminary studies, for there must have been many painstaking efforts before the masterpieces were achieved. Dr Kühn thinks that man made his first attempts at art when he picked up a stone with an accidental resemblance to an object and improved it by additional scratches and carvings ; and he mentions as an example the very rude representation of the head of a horse found at La Ferrassie in the Dordogne. He supposes that wall-paintings began by daubing red ochre round a hand held against the rock or by making imprints of a hand which had been covered with the ochre. All art at first was essentially naturalistic, though a few examples of ornament in dots and lines are found in deposits as old as the Middle Aurignacian.

Dr Kühn gives a well-illustrated account of the East Spanish art, and contrasts it with the Franco-Cantabrian. Here the figures are usually not isolated, but grouped into scenes, often hunting scenes. Here they are in the attitudes of lively movement ; and all effects are produced without shading, merely by skilfully drawn silhouettes. Most of the sketches are comparatively small, and they are usually on the walls of rock-shelters, not in the remote recesses of caves. They are often superposed one on another, and the latest of all pass into conventional symbols. Dr Kühn thinks they belong to all periods from the Aurignacian to the Neolithic, and must be the handiwork of a race distinct from that which produced the Franco-Cantabrian art.

The Capsian art on exposed rock-surfaces in northern Africa is very exhaustively treated, and the illustrations include many beautiful photographs by the author himself. The archaic style of the bold incised outlines of the figures is well emphasized. Dr Kühn points out that in Egypt, outline drawings of the same type are seen on the Neolithic and early dynastic pottery, and he considers that the Palaeolithic passes insensibly into the Egyptian culture. When the Sahara dried up, only the valley of the Nile remained habitable. Conditions here led to agriculture and the rapid development of human endeavour.

In conclusion, Dr Kühn discusses the ever absorbing question of the meaning of Palaeolithic art. He agrees with the general opinion that it was mainly inspired by ideas of magic, though he admits that some of it—especially the earliest—was due to purely aesthetic motives. His concise and clear statement of the problem will be read with great interest.

A. S. Woodward.

A HISTORY OF THE ANCIENT WORLD. *By* M. Rostovtzeff. Vol. I. The Orient and Greece, *translated by* J. D. Duff. *Oxford : at the Clarendon Press, 2nd edition.* 1930. *pp.* xii, 418, *and* 36 *figures*, 90 *plates.* 21*s.*

It is scarcely necessary to introduce M. Rostovtzeff's work, which after being reprinted in 1928 is now in its second edition. Although no changes have been made in the sections dealing with Greece, the author has been led to make certain additions to his chapters on the Orient by the finds made during recent years. These additions

consist for the most part of new plates, with full descriptions of the essential features of the discoveries. Such is the case, for instance, with the royal tombs of Ur, where a reproduction of the ' Standard ' is given, and with the Sumerian palace of Kish. The pages treating of Oriental history are intensely vivid, and all praise is due to the author for devoting so much of his volume to this subject, to which most ancient historians assign only half the importance that they give to Greece, as if Asia and Egypt were not the cradle of civilization, and as if behind Greece were not the East ! The ninety plates, many of them containing several figures, are excellent and form an unrivalled series of illustrations, inasmuch as not only the classic works of art are shown, but also others that are very characteristic but less well known. The book concludes with a bibliographical summary ; there is also a chronological table in which, while assigning the usual date —the end of the fourth millennium B.C.—to the beginning of the epoch hitherto considered as historical in Asia, yet perhaps, in view of recent knowledge, M. Rostovtzeff places the dynasties of Kish, Uruk, and Ur somewhat too early, in dating them at the beginning of the fourth millennium. G. CONTENAU.

LES TERTRES FUNÉRAIRES PRÉHISTORIQUES DANS LA FORÊT DE HAGUENAU ; tome II : Les tumulus de l'Age du Fer. *Par* F. A. SCHAEFFER. *Haguenau (Alsace): Publications du Musée (éditeur*, G. GROMER, *conservateur). Imprimerie de la Ville*, 1930. *pp.* XI, 332 *and* 30 *plates*, 191 *text-figures. Price not stated.*

Readers of the first volume of this work, which appeared in 1926 and was devoted to the Bronze Age interments of the Haguenau forest, have ever since eagerly awaited the publication of its companion on the Iron Age : that they have had some years to wait has been due partly to M. Schaeffer's mission to Syria in 1929, which has recently been renewed with such brilliant results, and partly to the exacting standard of work he has so consistently set himself in writing, draughtsmanship and comparative study. The result is that these are the best publications that have been produced in France since the War. The paper is good, the type-setting clear and the founts pleasant ; the photography is at worst tolerable and sometimes quite excellent, and the author's line-drawings in the text, which represent about a thousand objects, form a monument to his patience and skill only occasionally marred by excessive reduction ; our only serious criticism of them is that the index-figures and numbers should be much larger and more boldly and legibly written—as it is, it is often quite hard to make out with their aid which object of a set is which.

The multitude of Iron Age barrows in the Haguenau district, which lies between Strasbourg and the northern frontier of Alsace, all belong to the Hallstatt or the very earliest La Tène period, after which flat-grave inhumation (and subsequently cremation) in the Gaulish manner came in. The first part of the book gives a complete illustrated inventory of every known grave-group. M. Schaeffer has evidently been at the greatest pains to verify the associations of objects in the groups from old excavations, of which Nessel's notes and sketches form the principal record, and consequently we have a most valuable series of wholly reliable material for the history of Hallstatt culture, the objects in each group being illustrated all together and as far as possible to a common scale.

In the second part, on the other hand, each class of objects is taken by itself and treated chronologically in the light of the evidence recorded in the first part and of comparative material, which the author has zealously sought out all over Central Europe and

Italy. The essay on feminine costume and adornment is most important for its treatment of brooches, pins, bracelets, and torcs, and in particular of the peculiar serpent-ornamented torcs of the final Hallstatt phase, of which a distribution-map (p. 238) is given. Also, the splendid material provided by the decorated bronze belts is reviewed in a skilful essay establishing that they were worn (in Alsace at least) exclusively by women, and that the history of their decorative design proceeds from an initially rich variety of geometric and figure subjects, through degrees of simplification in which figure subjects disappear, to final decadence and monotony. Masculine equipment is as carefully treated, and the pottery should have a special interest for English readers, for, as is pointed out in the introduction with acknowledgement to Mr Dunning, it was in the Upper Rhineland that the Hallstatt pot-types of the Low Countries originated, which at the end of the epoch were brought over to Britain.

In general, the chronological review makes it clear that the orthodox fourfold Hallstatt chronology cannot be rigidly applied all over Central Europe, and for that reason comparative work like M. Schaeffer's between one culture-province and another is all the more essential. The four phases he delimits for Haguenau are (1) transition from the Bronze Age, beginning nevertheless after a complete break in continuity marked by the incursion of Urnfield people, (2) middle Hallstatt, corresponding roughly to the orthodox Hallstatt C and earlier D, (3) final Hallstatt, (4) earliest La Tène. Save under exceptional influence, the rite is inhumation throughout, and the body is normally placed in the make-up of the barrow itself, not in a grave beneath it.

Concerning absolute dating, M. Schaeffer is reticent: perhaps at present this is wise. For the crucial centuries between the break-up of the Middle Bronze Age cultures and the La Tène period, every province of Europe has its contributions to the outstanding problems and to their solution. In M. Schaeffer's hands, those of Alsace have become of the first importance. But any ultimate work of synthesis must rely for accurate chronology on the fruits of intensive work in the Near East. May it be given to M. Schaeffer to do there for the whole of Europe something of what he has done for his own country.

CHRISTOPHER HAWKES.

MISSION ARCHÉOLOGIQUE EN HAUTE DJÉZIRÉ (1928). *Par* A. POIDEBARD. (Offprint from *Syria*, 1930. *pp.* 33–42, *with map and four plates*).

Knowing the honourable place which the EDITOR holds as the pioneer of the pursuit of archaeology from the air, readers of ANTIQUITY should be specially interested in this all too brief report. The campaign which it describes lasted less than three months, and it is indeed astonishing that Father Poidebard should have been able within such a brief space of time to add so much to our knowledge of this particular part of the eastern frontier of the Roman Empire. The result is due not merely to the effective use of the aeroplane by skilled military observers, but also to the admirable combination of restraint and foresight with which the whole expedition was managed. Perfectly definite objectives were selected for investigation, and attention was strictly concentrated on each of these in turn. The country examined lies west of a line between Nisibis and Singara, and it is instructive to note the successive *limites* drawn by the Romans as barbarian pressure increased. The present summary was communicated to the Académie des Inscriptions et Belles Lettres. When the full account is published, students of Hadrian's Wall should find in it not a little material that should be of value for comparative purposes.

GEORGE MACDONALD.

THE DEFENCES OF THE ROMAN FORT AT MALTON (Roman Malton and District, report no. 2). *By* PHILIP CORDER, M.A., *with contributions by* H. MATTINGLY, M.A., *and* M. R. HULL, M.A. *Leeds : Roman Antiquities Committee of the Yorkshire Archaeological Society*, 1930. *pp.* 116, 49 *figs. in line and half-tone.*

This, the second volume of the series that is to deal with Roman Malton and district, is even better than its predecessor. Clear narrative, excellent plans, sections, and half-tones, and full illustration and description of the pottery that dates the many levels involved, combine to make a report as good and as readable as any that we have seen. A few years ago, it was not even certain that there was a Roman fort at Malton ; now, thanks to the energy of Dr Kirk and his colleagues, its existence and an outline of its history have been established : and from Mr Philip Corder's pen comes a publication for which all students of Roman Britain will be grateful. Among the outstanding results we will mention two : the site was clearly occupied early in the reign of Vespasian, perhaps earlier than York itself ; and in the 4th century, when York's garrison seems to have been reduced, Malton was held in force. The coastal defence system may well have occasioned the change. Mr Mattingly's treatment of the coins is full and instructive ; the description and drawings of the figured ' samian ' are not up to the standard of the rest of this valuable work. ERIC BIRLEY.

A LITTLE GUIDE TO ESKDALE. *Written and illustrated by* SILVERPOINT. *Ulverston : Atkinson*, 1930. 6*d.*

With a dozen pages of text and four full-page photographs, this little guide-book, whose author conceals the name of a well-known local antiquary beneath a graceful *nom-de-plume*, is thoroughly to be recommended to all who visit West Cumberland. Much of it is concerned with the antiquities of the valley—prehistoric, Roman, medieval —and it is of excellent quality. R. G. COLLINGWOOD.

THE POETIC EDDA IN THE LIGHT OF ARCHAEOLOGY. *By* BIRGER NERMAN. *Coventry : Published for the Viking Society by Curtis and Beamish*, 1931. 7*s.* 6*d.*

The Viking Society has done well in supplementing an earlier publication, Stjerna's account of the archaeological material in *Beowulf*, by this companion study of the Poetic Edda, and it is to be congratulated on securing Dr Birger Nerman as author. His work is a slender little essay, but it is unquestionably a valuable and interesting experiment ; I say *experiment* because the success of this study was not by any means a foregone conclusion, as there is really very little satisfactory material for the archaeologist in these poems, and I notice that in most instances where Dr Nerman finds a reference to objects that he believes he can date he very honestly warns us that he is dealing with passages that philologists might perversely choose to interpret differently. My own impression, however, is that the author has made out a very good archaeological case in whole-hearted support of the modern view of the chronology of the poems, but I have no doubt that Dr Nerman would be the first to admit that the archaeological evidence is far from being the most important contribution to the complete argument. The chief items discussed are frosted glass goblets, silver dishes, jewelled metalwork, ring-swords, twisted gold collars, and silver neck-rings, and Dr Nerman also makes excellent use of his preliminary survey of the ' Gold Age ' (A.D. 400–550) and the Viking ' Silver Age ' in the north. The illustrations are familiar, but abundant and excellent ;

my only complaint about the book is that the author ought to have translated for us all his numerous extracts from the poems ; Cleasby makes a rather tiresome companion to this slim little book. T. D. KENDRICK.

GREEK-ROMAN TREASURES OF GERMAN MUSEUMS. *Edited by* KARL KIESEL *and* ERNST O. THIELE. *Berlin : Terramare Office*. 1929.

Designed to attract tourists to German and Austrian museums of Classical antiquities. A series of quite general articles by officials of these museums on Graeco-Roman sculpture, pottery, etc., in these collections, with some illustrations. The most interesting feature is an account of the new museum in Berlin for the Pergamene Altar and other architecture. The English is (as the title suggests) sometimes uncomfortable, but never incomprehensible. Many proper names require revision : Milet, Marc Aurel, etc. ; also such forms as ' Lecythes ', ' Silenes '. The tourist will find this booklet informative ; it includes two pages of tabulated information as to the hours, charges, and so on, of the various museums.

The series of photographic introductions to the history of art produced by the University of Marburg (published by Teubner) deserves high praise, and should, at its reasonable price, be widely patronized in this country. We have received the following :—

Olympische Kunst (introduction by R. Hamann), 1923.
Griechische Tempel (introduction by P. O. Rave), 1924.
Tempel Italiens (introduction by P. O. Rave), 1924.

Each contains about 60 illustrations, excellently reproduced from new photographs, embracing many very useful views of details (*e.g.*, the capitals of columns), and some exceedingly beautiful pictures. The Olympia number is chiefly concerned with the temple sculptures ; the Hermes and the Nike of Paionios are also included. The Greek temples range chronologically from the Old Temple at Corinth to that of Olympian Zeus at Athens. The Italian number gives, on account of the better preservation of many buildings, perhaps a better conception of the world in which Greeks and Romans lived. A bibliography printed on a loose page to accompany the Temple numbers will be useful, especially if it is kept up to date by periodic re-issue. The price of each number is 3 marks in stiff paper cover, or 5 marks bound.

DIVINITÀ IGNOTE. *By* SILVIO FERRI. *Firenze : Vallecchi*, 1930. *pp.* 148 *with* 44 *plates and* 49 *figures*. 100 *lire*.

AGRIGENTO. *By* PIRRO MARCONI. *Firenze : Vallecchi*, 1930. *pp.* 238 *with* 162 *figures*. 100 *lire*.

The youthful and energetic Società Magna Grecia is bringing out under the direction of U. Zanotti-Bianco a series entitled ' Il Mezzogiorno artistico ' in which these form the third and fourth volumes. Each of them is very fully and handsomely illustrated. Vol. I of the series is by Alda Levi, and deals with the terracottas in the Museum of Naples ; vol. II, by T. Brenson, consists of 52 drawings with an accompanying text, entitled ' Visioni di Calabria '.

Divinità Ignote is in two parts, of which the second may be familiar to some readers as it has already appeared in almost the same form in the *Bollettino d'Arte* of 1927. It is a discussion as to the proper composition and restoration of the fragments of two

equestrian groups found at Locri (Gerace in Calabria). The author will not allow that these are simply the figures of Castor and Pollux but considers them rather as unnamed youths, connected with funerary cults. This is the rather loose link which connects part 2 with part 1, a very curious essay of which it is difficult to give an impression in brief form. Ferri is concerned primarily with trying to explain the meaning and significance of various ' unknown gods ' (a long series, amongst which one was noted by S. Paul) and objects of cult connected with them. The essay opens with illustrations and descriptions of the enigmatic faceless busts found at Cyrene. It proceeds to discuss with a good deal of curious learning and much ingenious fancy the symbolism of the tomb-form, and all the accessories in sculpture and pottery which belong to it. Though somewhat too imaginative the author has some interesting suggestions and reflections.

Marconi's *Agrigento* is very different in style, a quite direct record of the excavations made by him in the last few years at Agrigento, as we must now learn to call the familiar Girgenti. The results add a great deal to our previous knowledge and in some respects modify it. Marconi finds, for instance, that Freeman's very reasonable theory of the process by which the city grew is in contradiction with the archaeological evidence. The walls were apparently laid out in their full extent at the moment when the city was founded. Marconi has new information to add about all the temples, but especially about the Olympieion where his excavations have solved the chief riddles of the construction. His most interesting discoveries however, are those relating to the worship of chthonian deities at altars older than any of the temples. Very important, too, are the traces of archaic temples of the 6th century preceding the well known 5th century examples which still exist for our wonder and admiration. The book is indispensable to all who are making a close study of Greek temples or of Sicilian archaeology.

D. RANDALL MACIVER.

THE FLOOD : NEW LIGHT ON AN OLD STORY. *By* HAROLD PEAKE. *Kegan Paul*, 1930. *pp.* x, 124, 11 *figs.* 5*s*.

Among the different races of Western Asia, the ancient tradition was preserved of a flood far more immense than the annual overflowings of the Euphrates and Tigris. This catastrophic destruction of the countries so affected was never forgotten, and its history has been told in such accounts as the Hebrew story of the Deluge or the Babylonian poem on the same subject. The excavations quite recently made at Ur in ancient Sumeria (lower Mesopotamia) and at Kish in ancient Akkad (middle Mesopotamia) have revealed traces of this flood, in the shape of an alluvial deposit, more or less thickly spread, which interrupted the course of civilization. But the culture strata separated by the deposit are not entirely the same at Ur as at Kish, where traces of two or even three inundations have been found. Mr Peake's special merit is that he attempts to coordinate these different data. Using the stratigraphical evidence, he holds that the two principal floods—indicated by the deposits at Ur and by the first deposit at Kish—were contemporaneous. He then investigates the possibility of applying to these results the historical data in our possession. He suggests the date of 5000 B.C. for the beginnings of civilization in Mesopotamia and Elam, then 4250 for the period of the first flood, 3950 for the second ; thus 3750 would be the date of the first dynasty of Ur, with the rulers Mes-kalam-dug, Shubad, and the unknown king her husband, while Mes-anni-padda, hitherto considered as a member of the first dynasty at Ur, would belong to the second, dating from about 3295 B.C. Mr Peake's suggestions deserve

consideration, for he has excellent knowledge of all the elements of the problem ; but I think that he should put considerably later the dates which he proposes for the first dynasty of Ur ; I have given my reasons elsewhere in this journal. On one point, however, I cannot agree with him ; the traces of script forming the name Mes-kalam-dug, engraved on two golden bowls from his tomb, could only go back to a period just before the dynasty of Agade, so that Mes-kalam-dug should not be placed among the first occupants of ' royal tombs ', but among the last. As may be seen from this short summary, Mr Peake deals in this book with one of the most captivating problems of the primitive history of Mesopotamia. G. CONTENAU.

A HISTORY OF ANCIENT PERSIA FROM ITS EARLIEST BEGINNINGS TO THE DEATH OF ALEXANDER THE GREAT. *By* R. W. ROGERS. *New York and London : Scribner*, 1929. *pp.* IX, 393, 63 *figures and plans*. 30*s*.

The value of Dr R. W. Rogers' *Ancient Orient* is sufficient guarantee of the excellence of his present work, which is more limited in scope. It appears at an opportune time, for the recent discoveries in Persia and the fuller research contemplated there give it special interest. The author has compiled what has hitherto been lacking—a good handbook dealing exclusively with Persia. His book covers the period of the Achaemenids, when the name of Persia first began to be used for the Iranian plateau, the Elam or ' highlands ' of the Assyro-Babylonians. Mr Rogers first gives a short account of the country, the origins of the Medes and Persians who peopled it, and the religious system which they developed ; he then traces reign by reign the political and social history of Persia, those struggles to overthrow the power of the Palace and to unravel its intrigues, and the ceaseless attempts at imperial aggrandizement. We see the conquest of Egypt, the exhaustion caused by the Persian wars, and all the events up to Alexander's conquest and the organization of his new empire. The illustrations are chosen to show us the most characteristic monuments of Persian civilization, to whatever province of the Empire they belong ; in the case of the last period, place of honour is given to the famous sarcophagus, said to be Alexander's, discovered at Sidon and now in the museum at Stamboul. One of the striking qualities of the book is its lucidity and the due weight given to facts according to their relative importance. G. CONTENAU.

SUMERIAN LEXICAL TEXTS FROM THE TEMPLE SCHOOL OF NIPPUR. *By* E. CHIERA. (University of Chicago, Oriental Institute Publications, vol. XI, Cuneiform series vol. I). *Chicago : University Press*, 1930. *pp.* X, 19, 126 *plates*. 42*s*. 6*d*.

The tablets published in this volume form part of the collection in the museum of the University of Pennsylvania at Philadelphia ; they consist of texts in the Sumerian tongue, the work of scribes from the Temple of Nippur (the modern Niffer). Owing to the complicated cuneiform script and to the use of Sumerian, a sacred language, simultaneously with that of Assyrio-Babylonian, the vernacular, very many schools of scribes arose, usually associated with temples. The tablets having such an origin form sometimes the actual library ; sometimes they are model examples or the work of pupils, and they illustrate the method of the scribes' apprenticeship. The lists are made up either of words that are synonymous or at least very close in meaning, or else they are names of deities or geographical terms, or names of objects such as stones or fields, or names of officials, etc. But in spite of this remarkable variety, the scribe takes pains to be complete in each new range of subjects, even at the cost of monotony. The tablets

are inscribed both on the obverse and reverse, and often the texts on either side vary considerably in character; their contents are not arbitrarily chosen, but are reproductions of an original which in some cases is still extant, or variations on that original. They can be dated to about 2000 B.C., and form part of a lexicographical compilation in use up to the fall of the Assyrian empire. Dr Chiera's transcripts are well done and will be most useful to Assyrian scholars; he has made a notable contribution to our knowledge of the standard of learning attained by the Babylonian scribes. G. CONTENAU.

LA TÈNE IN NIEDERÖSTERREICH. *By* R. PITTIONI. (Materialen zur Urgeschichte Österreichs v). *Published by Private Press of the Anthropologische Gesellschaft, Vienna*, 1930. *pp.* 136, *plates and map.* 20 R.M.

In publishing a detailed account of La Tène finds in Lower Austria Pittioni has done a great service. Thanks to this book and to two admirable contributions by Mahr and Merhart, our knowledge of Lower and Upper Austria and the Tyrol during the La Tène period is by no means inadequate—would this were so of Styria and Carinthia!

In the Hallstatt period the cultures of Upper and Lower Austria differ strangely from each other, and there is little evidence at that time for relations from west to east along this section of the Danube valley. Pittioni observes that the same state of things existed—at all events as far as southern imports were concerned—during the ensuing early La Tène phase. This, as indicated, is probably due to the two regions in question being linked to the south by different routes, *viz.*, the Central and Eastern 'amber-routes', which connected up with northern Etruscan and Atestine territory respectively.

Pittioni's theory of origin of the lenticular flask (the earliest examples of which occur during La Tène A in Eastern Bavaria and Western Bohemia) though attractive is surely unsound. The Lower Austrian examples do not occur before La Tène B. Pittioni derives the lenticular flask from degenerate late Hallstatt derivatives of the Villanovan biconical ossuary found in Southern Styria and Lower Austria (cf. fig. 14a). This pre-supposes the existence of a late Hallstatt culture in northeast Bavaria, and west Bohemia (where the earliest lenticular flasks appear) more or less identical with that found in southern Styria and Lower Austria, which is far from being true. Certain of the types classified by Pittioni in his group of derivatives from the lenticular flask (*e.g.*, plate 1; 2, 4 and 7—all La Tène C) show greater affinities with northeast Bavarian La Tène A forms other than the lenticular flask (*e.g.*, Lindenschmidt, *Altertümer unserer heidnischen Vorzeit*, v, *pl.* 50, *nos.* 897, 899, 901). Further, the La Tène C vessel from Wolfsthal (pl. 1, 2) resembles the La Tène A urn from a recently excavated tumulus at Maxglan near Salzburg (cf. *Wiener Prähist. Zeitschr*, XVII, 1930, p.59).

Wimmer's excursus on the La Tène burials from Guntramsdorf with their contracted skeletons and trepanned skulls is of great interest. In connexion with the latter one is reminded of the trilobe cranial amulet found in a La Tène context at Somme Bionne (Marne). Similar amulets, but in bronze, occur in the late Hallstatt cemetery at Les Jogasses, near Épernay. J. M. DE NAVARRO.